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UNIVERSITI PUTRA MALAYSIA

FAKULTI KEJURUTERAAN
FACULTY OF ENGINEERING
فاكولتي كجوروتراءن

The 6th

International Conference on Agricultural and Food Engineering

CAFEi 2023

"GLOBAL FOOD AND AGRICULTURE RECOVERY IN THE POST-PANDEMIC WORLD"

16 - 17 AUGUST 2023

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THE VICE CHANCELLOR OF UNIVERSITI PUTRA MALAYSIA

It is my utmost pleasure to welcome you all to the 6th International Conference on Agricultural and Food Engineering 2023 (CAFE*i*2023), organized by the Department of Process and Food Engineering and the Department of Biological and Agricultural Engineering, Universiti Putra Malaysia. This conference theme is "Global Food and Agriculture Recovery in a Post-Pandemic World". The world has endured a global health crisis that has tested our resiliency, revealed our vulnerabilities, and profoundly disrupted our daily lives. In addition to posing threats to public health, the COVID-19 pandemic has exposed the fragility of our global food supply chains and the inherent vulnerability of our agricultural systems.

As we begin to rise from the depths of this crisis, it is very necessary for us to come together in order to tackle the problems and grab the possibilities that have been provided to us. There has never been a time when the need for a worldwide recovery in the areas of food and agriculture was more critical than it is right now. We have an obligation to make certain that our technologies or systems are not just resilient enough to resist any shocks in the future, but that they are also created to promote sustainability, inclusiveness, and equal access to nourishing food for all people.

I strongly believe that the organizers have been able to gather people from all across the world to be here at UPM. I hope that CAFE*i*2023 provides an important forum for the sharing of information, collaboration, and the development of new ideas. We have assembled a group of reputable researchers, academics, policymakers, and practitioners who have dedicated their careers to deciphering the complexity of our food systems and finding practical solutions to the urgent problems we are now facing. I have high hopes that we will be able to take part in enlightening presentations and critical discussions and investigate cutting-edge research. Together, we are going to investigate the numerous aspects of global food and agricultural recovery, including climate-smart farming practices, resilient supply chains, technological advances, AI technology, and sustainable policy frameworks.

While we are focused on recovering from the epidemic, we must also recognize the greater existential concerns that we face, such as climate change, war, biodiversity loss, and socioeconomic inequality. We cannot afford to look at these issues in isolation. Instead, we must adopt a comprehensive and integrated strategy that tackles the interdependence of food security, environmental sustainability, social justice, and economic growth. I hope that we have a chance to design a road toward a more resilient, fair, and sustainable future by using the combined knowledge, skills, and experiences of all participants. This conference seeks to be a catalyst for tangible ideas that can be adopted at the local, regional, and global levels, ensuring that food sustainability can be achieved. In Malaysia, UPM has a long and reputable history of addressing not only Malaysia's needs in the field of food and agriculture but globally as well.

I would like to express my heartfelt appreciation to the organizing committee, as well as our valued partners, sponsors, and supporters. Your constant dedication to furthering knowledge and effecting good change is truly admirable. For participants, I hope you all have a fruitful and inspiring time at the conference, and I am convinced that the results of our talks and collaborations will pave the road for a brighter, more resilient, and more sustainable post-epidemic world. Thank you for joining CAFE*i*2023.

Malaysia Madani
With Knowledge We Serve

YBhg. Dato' Prof. Dr. Mohd Roslan Sulaiman
Vice Chancellor of Universiti Putra Malaysia

THE DEAN OF ENGINEERING FACULTY, UNIVERSITI PUTRA MALAYSIA

It is an honour and privilege to extend to you all a warm welcome to CAFE*i*2023. As a dean of the Faculty of Engineering at UPM, I am ecstatic to witness a meeting of talented researchers, practitioners, and industry experts who have devoted their efforts to addressing the critical challenges confronting the agricultural and food sectors in the wake of the global health crisis. The theme of this conference, “Global Food and Agriculture Recovery in the Post-Pandemic World”, underscores the critical importance of technological advancements, innovation, and interdisciplinary collaboration in shaping the recovery and transformation of our agricultural and food systems.

As we gather here today, it is important that we acknowledge the central role engineering has played in revolutionizing the agricultural and food industries. Engineering has the ability to optimize resource utilization, increase productivity, enhance food safety and quality, and develop sustainable practices that are critical to the well-being of both people and the planet. Precision agriculture, robotics and automation, sensing and monitoring, sustainable resource management, food processing and safety, and supply chain management are key areas where engineering plays a crucial role.

However, we must not overlook the importance of interdisciplinary collaboration. Today's challenges necessitate bridging the divide between engineering, agronomy, biology, environmental science, and the social sciences. By fostering interdisciplinary collaboration, we can create comprehensive and holistic solutions that address the complex relationships between technology, nature, and society.

I would like to extend my deepest gratitude to the organizing committee for their untiring efforts in bringing about the CAFE*i*2023. Their commitment and meticulous planning have provided us with a platform for sharing knowledge, fostering collaboration, and collectively addressing the most pressing challenges in agricultural and food engineering.

I would also like to express my appreciation for the contributions made by our distinguished lecturers, researchers, and industry professionals. Your knowledge and insights will unquestionably enrich our discussions and motivate us to push the boundaries of agricultural and food engineering. All the best for CAFE*i*2023!

Malaysia Madani
With Knowledge We Serve

THE CHAIRPERSON OF CAFE*i*2023

On behalf of the organizing secretariat, I would like to extend a warm greeting to all of the honourable guests, co-organizers, supporters, presenters, delegates, and participants in the 6th International Conference on Agricultural and Food Engineering, CAFE*i*2023. It is a great honour for me to be able to extend this invitation to all of you. This conference is held every two years, and the first time it was held was in 2012. The topic was "Bringing Engineering to Life." In the following years, the themes were "New Trends Forward," "Sustaining Agriculture, Preserving Lives," and "Adapting to Challenges," respectively. The most recent conference, CAFE*i*2020, was held online for the first time in 2021 owing to the pandemic caused by the Covid19 virus. The theme of the conference was "Agriculture 4.0."

CAFEi2023 will focus on "Global Food and Agriculture Recovery in a Post-Pandemic World" as its theme. We have chosen this theme to identify the needs, opportunities, and challenges associated with agricultural and food engineering, as well as how these fields can improve, rebuild, revitalize, renovate, and reimagine our methods and technologies to ensure the sustainability, resilience, and inclusivity of food production in the post-pandemic era. Throughout CAFEi2023, we will investigate a variety of topics, such as agricultural mechanization, soil & water, farm structure, bioprocess food processing, packaging, and others.

The distinguished keynote speakers for CAFEi2023 are Datuk Dr. Ahmad Parveez Hj. Ghulam Kadir, the director-general of MPOB; Prof. Dr. Ryozo Noguchi, from the Graduate School of Agriculture, Kyoto University, Japan; Prof. Dr. Raghavan Srinivasan, from the Department of Biological and Agricultural Engineering, Texas A&M University, USA; Asst. Prof. Dr. Masao Gen of Tohoku University, Japan; and Mr. Jeffry Faizal Kamaruddin from Upstream Malaysia, Sime Darby Plantation Berhad. We have more than 100 registered participants who have submitted their abstracts. High-quality full papers will be submitted for publication in the Journal of Applied Agricultural Science and Technology, Information Processing in Agriculture, Pertanika Journal of Science & Technology, Food Research, Journal of Agricultural and Food Engineering, and Advances in Agricultural and Food Research Journal.

I would like to express my deepest gratitude to the organizing committee for the arduous work that they have put in to make sure that this conference is a success. In addition, I would like to convey my appreciation to our great speakers, panelists, and presenters for sharing their expertise and points of view with us today. Your expertise will definitely elevate the quality of our discussions and motivate us to think creatively and expansively about related topics. Finally, I would like to convey my deepest gratitude to all of our partners and sponsors for their generous assistance during this endeavour. Their dedication to working toward the realization of the objectives of this conference is an essential component of our overall effort to develop a post-pandemic agri-food system that is both sustainable and resilient. Thank you all for your participation and contributions.

Malaysia Madani
With Knowledge We Serve

Assoc. Prof. Dr. Khairul Faezah Md. Yunos
Chairperson for CAFE*i*2023

APPRECIATION

The 6th

International Conference on Agricultural and Food Engineering

CAFE*i* 2023

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UNIVERSITI PUTRA MALAYSIA

BERILMU BERBAKTI

CO - ORGANIZERS

MSAE

MALAYSIAN SOCIETY OF AGRICULTURAL AND FOOD ENGINEERS

Est. 1982

MPOB

FTP

UNIVERSITAS BRAWIJAYA

ABOUT MPOB

The Malaysian Palm Oil Board (MPOB) is the premier government agency entrusted to serve the country's oil palm industry. Its main role is to promote and develop national objectives, policies and priorities for the well-being of the Malaysian oil palm industry.

It was incorporated by an Act of Parliament (Act 582) and established on 1 May 2000, taking over through a merger, the functions of the Palm Oil Research Institute of Malaysia (PORIM) and the Palm Oil Registration and Licensing Authority (PORLA).

Each of these respective organisations has been involved in the oil palm industry for more than 20 years and it is to render more effective services as well as to give greater national and international focus to the industry that MPOB was instituted.

MPOB holds a vision of becoming the premier Nobel Laureate-producing research and development institution, providing leadership and impetus for the development of a highly diversified, value-added, globally competitive and sustainable oil palm industry.

Its mission is to enhance the well-being of the Malaysian oil palm industry through research, development and excellent services.

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ABOUT FACULTY OF AGRICULTURAL TECHNOLOGY, UNIVERSITAS BRAWIJAYA

Universitas Brawijaya (UB) and the most prominent faculty in agricultural technology (FAT) in East Java, Indonesia. With more than 20 years of experience, FAT has produced qualified graduates, scientific works, and community services. Most of our graduate's career or become entrepreneurs in many sectors, including agriculture, food, and other agricultural product-related industries, and education, both at national and international levels. With 3 (three) Departments (Food Science and Technology, Biosystems Engineering and Agro-industrial Technology) and 11 (eleven) Study Programs, FAT offers a remarkable opportunity to feed the world and help the community through food science, agroindustry, and environmental-related technology. Most of the study programs are certified and internationally accredited. FAT has an excellent reputation due to extraordinary achievements at the national and international levels. Those achievements are contributed mainly by the students and staff, indicating the potential and quality of human resources and the learning process. FAT is committed to being a part of a world-class University. Therefore, FAT continues to develop high-standard research and education facilities and establish relationships with alums, partners, and stakeholders. FAT staff are also dedicated to bringing a high-quality education by providing state-of-the-art teaching and research.

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ABOUT MALAYSIAN SOCIETY OF AGRICULTURAL AND FOOD ENGINEERS

The Malaysian Society of Agricultural Engineers or MSAE is a learned society established in 1982. During the 39th Annual General Meeting, all the members agreed to change the name of this society from 'Malaysian Society of Agricultural Engineers' to 'Malaysian Society of Agricultural and Food Engineers'. It is a professional and technical organization of members who are interested in engineering knowledge and technology for food, agriculture, the associated industries, and related resources. The founding members were mainly lecturers of the Faculty of Agricultural Engineering, University Pertanian Malaysia (UPM) who had obtained their highest degrees from US universities. Since its induction, agricultural engineering professionals (i.e., agricultural engineers and agricultural engineering technical assistants) have significantly contributed to the development of agriculture in the country. To date, there are about 1,500 agricultural engineers and agricultural engineering technical assistants who are involved in agricultural and non-agricultural fields in Malaysia. Today, as the food engineering field develops further downstream of agricultural processing, it is important to emphasize that MSAE is involved in not only agricultural engineering but also food engineering.

We welcome new members from all fields of agriculture and food to join us. The activities of MSAE include establishing rapport and mutual cooperation with government bodies and private sectors in research and development; promoting the importance of agricultural and food engineers' involvement in organizations whose activities are related to agriculture and food; organizing international and national conferences, workshops, seminars and short courses; publishing; establishing and maintaining a working relationship with agricultural engineering societies of other countries, especially, those in the ASEAN region, eastern Asia and North America (particularly the USA and Canada); organizing technical competitions and visits; and organizing social, sports and recreational activities and technical visits, especially for members of the MSAE- Student Chapter.

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Universiti Putra Malaysia

Universiti Putra Malaysia (UPM) is a leading research university in Malaysia and is first established as the School of Agriculture in 1931. The school was located on a 22-acre piece of land in Serdang and offered two programs – a three-year diploma program and a one-year certificate course in Agriculture. In 1947, the school was declared as the College of Agriculture Malaya by Sir Edward Gent, the then Governor of the Malayan Union.

The establishment of Universiti Pertanian Malaysia came about when the College of Agriculture in Serdang merged with the Faculty of Agriculture, University of Malaya. Dr. Mohd. Rashdan bin Haji Baba, the then principal of the College of Agriculture Malaya, was appointed as the first Vice-Chancellor by virtue of the provisions of Section 18 of the Universities and University Colleges Act, 1971. With the first intake of 1,559 students, Universiti Pertanian Malaysia had its first academic session in July 1973 in three central faculties and one basic division: the Faculty of Veterinary Medicine and Animal Sciences, the Faculty of Forestry, the Faculty of Agriculture and the Division of Foundation Studies.

In the early 80s, UPM extended its area of studies to include the field of Science and Technology (S&T). In 1997, the name Universiti Pertanian Malaysia was changed to Universiti Putra Malaysia by former Prime Minister, Tun Dr. Mahathir Mohammad, as a strategic gesture to portray the status of UPM as a center of higher education capable of providing education in various fields of studies, especially in science and information technology that has spearheaded national development in the new millennium.

Faculty of Engineering

LEADING THE WAY IN EDUCATION EXCELLENCE

The Faculty of Engineering, UPM focuses strongly on teaching and learning, research and innovation, as well as professional services. Named as one of the best engineering schools in Malaysia by independent government assessments for its impressive modern facilities and dynamic approach to teaching and research, it constantly benchmarks the quality of its programs against those of world-renowned universities, winning numerous awards and accolades in the process and placed among the highest-rated faculties in the region. To equip students with the skills and knowledge required in meeting emerging workplace and career challenges, its curricula are subjected to a regular 5-yearly curriculum review to ensure that they meet the current market demands. As a testament to its successful commitment to quality education, the Faculty has attracted high-achieving students from around the world. The Faculty has been awarded the MS ISO 9001:2000 certification continuously since the year 2001.

GROWING FROM STRENGTH TO STRENGTH

The Faculty of Engineering was established in 1975 as the Faculty of Agricultural Engineering. Starting with only four departments, it has now grown to eight departments, focusing on some of the most advanced technological fields. Today, the Faculty is one of the largest faculties at UPM with a student population of over 3000. Its location in the heart of the Multimedia Super Corridor (MSC) of Malaysia provides the faculty with access to arrays of IT and multimedia facilities available in the Corridor.

The eight departments of the Faculty are the Departments of Aerospace Engineering, Civil Engineering, Biological and Agricultural Engineering, Electrical and Electronic Engineering, Chemical and Environmental Engineering, Computer and Communication Systems Engineering, Mechanical and Manufacturing Engineering, and Process and Food Engineering. A total of eight Bachelor and 36 research areas for postgraduate studies are offered. In line with UPM's inspirational motto, 'With Knowledge We Serve', the Engineering Faculty is fully committed to helping students develop holistically, developing cutting-edge technology and contributing to the creation of wealth and nation-building.

GLOBAL RECOGNITION THROUGH QUALITY RESEARCH

The Faculty is also known as one of the country's leading R&D centers for its work in various Research Centers focusing on engineering and related fields. The quality of these research findings is recognized through publications in reputable international journals, patents and publication awards. Each year, the Faculty produces over 1,000 publications, including 250 journal articles. One of the objectives of such prodigious research activities is to elevate the Faculty's international status in order to receive its due recognition.

HOLISTIC DEVELOPMENT FOR GLOBAL VISION

The Faculty provides a study environment conducive to students. Surrounded by nature, the faculty is equipped with all the amenities a top university, allowing students to enjoy social, recreational and sporting activities. Students are also encouraged to pursue broader interests through on-campus activities, from student politics, to arts, to sports. The diversity in UPM provides an unparalleled cultural learning experience. With a diverse student population coming from over 50 countries, students are exposed to a variety of cultures and languages. This environment helps students develop a globalized worldview so that they have the much needed international edge to equip them for the competitive job market.

PROGRAM OFFERED

BACHELOR PROGRAM

All bachelor programs offered in the Faculty of Engineering are accredited by the Engineering Accreditation Council Malaysia. They are:

1. Bachelor of Aerospace Engineering with honours
2. Bachelor of Agricultural and Biosystems Engineering with honours
3. Bachelor of Chemical Engineering with honours
4. Bachelor of Civil Engineering with honours
5. Bachelor of Computer and Communication Systems Engineering with honours
6. Bachelor of Electrical and Electronic Engineering with honours
7. Bachelor of Mechanical Engineering with honours
8. Bachelor of Process and Food Engineering with honours

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Department of Biological and Agricultural Engineering

Agricultural engineering education in Malaysia started as far back as 1961. A full bachelor degree program in agricultural engineering was introduced at the Faculty of Agricultural Engineering, Universiti Pertanian Malaysia in 1975. The first batch of agricultural engineers graduated in 1979. In 1980, the diploma level program in agricultural engineering was introduced. Since then, agricultural engineering professionals (i.e., agricultural engineers and agricultural engineering technical assistants) have significantly contributed to the development of agriculture in the country. To date there are about 1000 agricultural engineers and agricultural engineering technical assistants in Malaysia serving in both agricultural and non-agricultural fields. The department has evolved tremendously and become a leader in providing engineering solutions to agricultural problems in Malaysia.

Currently, the department comprises of 39 family members of 26 academic staffs, and 13 support staffs. The department is offering a four-year study of Bachelor of Agricultural and Biosystems Engineering with Honours, with four specialization options namely Mechanization and Automation, Postharvest and Environment, Soil and Water Resources, and Agricultural Informatics. The program offered is fully accredited by the Engineering Accreditation Council Malaysia and Malaysian Qualifications Agency. The program is also recognized by the Washington Accord Signatories. We also provide research-based learning opportunities through the postgraduate degrees in Masters and PhD levels to continue extend the frontier knowledge in the area of agricultural and biosystems engineering. Join our internationally-renowned postgraduate studies focus on fundamental and applied research in thrust areas which include but not limited to Agricultural Mechanization and Automation, Agricultural Robotics Engineering, Agricultural Informatics, Precision Farming, Post-Harvest Engineering, Agricultural Process Engineering, Soil and Water Resources, Irrigation and Drainage Engineering, and Safety, Health and Environment. We are certified by ISO 9001: 2008 for all operations including matters pertaining to teaching and learning processes. Outcome Based Education (OBE) has been adopted as the main approach of teaching and learning at the department towards good quality and world-class education. We welcome you to work with us whether to further your education, to do collaborative research, to utilize our expertise as consultants or in any other manner that will benefit the quality of life.

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POSTGRADUATE PROGRAMS AT THE DEPARTMENT OF BIOLOGICAL AND AGRICULTURAL ENGINEERING

MASTER WITHOUT THESIS

A non-thesis program is offered in Emergency Response and Planning. Students enrolling in this program must fulfill a minimum of 40 credits of coursework with a study period of 1½ - 2 years.

Contact person:
Dr. Muhammad Razif Mahadi
Coordinator of Master of Emergency Response and Planning
E-mail: razifman@upm.edu.my

MASTER WITH THESIS & PHD

The Master (1½ - 3 years) and the Ph.D. (2 - 4 years) programs are offered in the following fields of studies encompassing all the thrust areas:

1. Agricultural Mechanization and Automation
2. Agricultural Process Engineering
3. Agricultural Waste Engineering
4. Soil and Water Engineering
5. Farm structures

A thesis is required for graduation.

Contact person:
Associate Professor Dr. Md Rowshon Kamal
Coordinator of Postgraduate Studies
Email: rowshon@upm.edu.my

Department of Process and Food Engineering

The Department of Process and Food Engineering offers fully accredited engineering courses tailored to the current needs of the process and food engineering industries both in Malaysia and globally. Since its establishment, the Department has already produced over 1000 graduates who are currently having successful careers not only in the food processing industry but also in nutraceutical, chemical, packaging, and other related industries. As the demand for safe and abundant food has increased globally, we are always committed to improving our degree programme to cope with the constantly evolving industrial needs, thus producing graduates who are able to adapt to the current issues and challenges in the food and process industries. To steer the program toward greater success, the Department is supported by 24 of PhD qualified academic members and four professors. Six of the academic members have professional engineer status, and another four have chartered engineer status.

The department's signature program, Bachelor of Process and Food Engineering with Honours, has three specialized options; Food Engineering, Bio-Material Process Engineering, and Processing Machine Design Engineering. The Food Engineering option emphasizes the application of process engineering principles and concepts for food processing industries, whereas the Bio-Material Process Engineering option focuses on the processing of major agricultural commodities and developing new bio-based products to be applied as food materials or as raw materials for manufacturing industries. In the Processing Machine Design Engineering option, the students are exposed to the processing machinery elements design and dynamics as well as processing machinery systems and automation. The Department also offers Master of Science (MSc) and PhD degree programs with theses in four main research areas; Food Engineering, Packaging Engineering, Bioprocess Engineering, and Agricultural Process Engineering. Our newly structured program is being offered bi-annually; Master of Science in Food Process and Packaging Engineering (without thesis).

Contact person:
Professor Ir. Dr. Siti Mazlina Mustafa Kamal
Head
Department of Process and Food Engineering
Email: smazlina@upm.edu.my

POSTGRADUATE PROGRAMS AT THE DEPARTMENT OF PROCESS AND FOOD ENGINEERING

MASTER WITHOUT THESIS

A non-thesis program is offered in Food Process and Packaging Engineering. Students enrolling in this program must fulfill a minimum of 40 credits of coursework with a study period of 1½ - 2 years.

Contact person:
Dr. Nor Amaiza Mohd Amin
Coordinator of Master in Food Process and Packaging Engineering
Email: myza@upm.edu.my

MASTER WITH THESIS & PHD

The Master (1½ - 3 years) and the Ph.D. (2 - 4 years) programs are offered in the following fields of studies encompassing all the thrust areas:

1. Food Engineering
2. Packaging Engineering
3. Bioprocess Engineering and
4. Agricultural Process Engineering

A thesis is required for graduation.

Contact person:
Dr. Intan Syafinaz Mohamed Amin Tawakkal
Coordinator of Postgraduate Studies
Email: intanamin@upm.edu.my

Conference on Agricultural and Food Engineering (CAFE*i*)

The 6th International Conference on Agricultural and Food Engineering (CAFE*i*2023) is a renowned biennial event that has been shaping the landscape of agricultural engineering since its inaugural gathering in 2012. Over the years, CAFE*i* has delved into transformative themes, including "Bringing Engineering to Life," "New Trends Forward," "Sustaining Agriculture, Preserving Lives," and "Adapting to Challenges," which have captivated scientific minds and led to groundbreaking discussions.

Addressing the challenges posed by the Covid-19 pandemic, CAFE*i*2020 bravely adapted to an online format in 2021, facilitating unity and exploration within the realm of "Agriculture 4.0."

In anticipation of CAFE*i*2023, we are focused on the vital theme of "Global Food and Agriculture Recovery in a Post-Pandemic World." This theme stems from a deep commitment to identifying the needs, opportunities, and challenges within agricultural and food engineering. Collaboratively, we seek innovative ways to enhance, rebuild, revitalize, renovate, and reimagine our methods and technologies, ensuring sustainable, resilient, and inclusive food production in the aftermath of the pandemic.

CAFE*i*2023 offers an array of engaging scientific topics, including agricultural mechanization, soil and water management, farm structure optimization, bioprocess food processing, advanced packaging solutions, and more. By uniting leading experts, researchers, and policymakers, we aspire to cultivate profound discussions, igniting novel ideas, and propelling progress in agricultural and food engineering.

Embark with us on this intellectual journey at CAFE*i*2023, and let us collectively shape a brighter and more resilient future for global food and agriculture. We eagerly anticipate your valuable contributions and the meaningful connections that will undoubtedly arise during this esteemed conference.

CONFERENCE AT A GLANCE

WEDNESDAY 16 AUGUST

8:30 am Virtual Check-In and Organizer Overview

8:45 am - 9:40 am

Opening Ceremony

- CAFE*i*2023 Montage
- Welcoming Remarks by Chairperson of CAFE*i*2023
  Assoc. Prof. Dr. Khairul Faezah Md Yunos
- Opening Address by Vice-Chancellor of Universiti Putra Malaysia
  YBhg. Dato' Prof. Dr. Mohd Roslan Bin Sulaiman
- *"Opening Enchantment: CAFEi2023 Unveiled"*
- MiKu Products Launching Ceremony

9:30 am - 10:00 am

Session Break

10:00 am - 10:50 am

Keynote 1

Climate Change Impact on Food and Water for the Next Generation

Prof. Dr Raghavan Srinivasan

Texas A&M University

10:50 am - 11:40 am

Keynote 2

Managing Plantation Industry Recovery in The Post Pandemic World

Mr. Jeffry Faizal Kamaruddin

Sime Darby Plantation Berhad

11:40 am - 12:30 pm

Keynote 3

Particle Engineering for Environmental Analysis

Assoc. Prof. Dr. Masao Gen

Tohoku University

THURSDAY 17 AUGUST

8.00 am Virtual Check-In

8:30 am - 10:30 am

Parallel Sessions 1

10:30 am - 10:45 am

Session Break

10:45 am - 12:45 pm

Parallel Sessions 2

12:30 pm - 2:15 pm

Session Break

12:45 pm - 2:15 pm

Session Break

2:15 pm - 3:00 pm

Keynote 4

Embracing Challenges and the Way Forward for Enhancing the Oil Palm Supply Chain in The Post-Pandemic Era

Datuk Dr. Ahmad Parveez Hj Ghulam Kadir

Malaysian Palm Oil Board (MPOB)

2:15 pm - 4:15 pm

Parallel Sessions 3

3:00 pm - 4:00 pm

Keynote 5

System Analysis and Environmental Impact Assessment for Food Production and Biological Resource Utilization

Prof. Dr. Ryozo Noguchi

Kyoto University

4:15 pm - 5:15 pm

Closing Ceremony

- Closing Remarks by 2nd Chairman of CAFE*i*2023
  Prof. Ir. Dr. Hasfalina Che Man
- Announcement of CAFE*i*2023 Best Paper and Best Poster Awards

KEYNOTE SPEAKER I

Dr. Raghavan Srinivasan

Professor
Department of Ecology and Conservation Biology & Biological and Agricultural Engineering, Texas A&M University, USA
Email: r-srinivasan@tamu.edu

R. Srinivasan is a renowned professor at Texas A&M University and director of the Spatial Sciences Laboratory. He is internationally recognized for his pioneering work in spatial sciences and computer-based modeling, particularly the Soil and Water Assessment Tool (SWAT) model. His research has had a profound impact on natural resource assessments and management systems in over 90 countries. Over the past nine years, he has conducted more than 60 international workshops for students and professionals in more than 20 countries. He was the Principal Investigator or Co-PI on USAID, EPA, NOAA, DOE, USDA, NASA, and NSF research grants. He is a member of the EPA's advisory group for national water quality assessments. He was a member of TNRCC's science and technical advisory committee on the proper procedures to adopt TMDL for Texas from 1998-1999. He was appointed as a member of the Scientific Advisory Panel in the FIFRA Scientific and as an associate Editor for Sustainability, a Special issue from 2016-2018. With an extensive background in hydrological modeling, he developed the innovative Hydrologic and Water Quality System (HAWQS), revolutionizing the user interface and data support for SWAT, making it widely regarded as the most comprehensive platform for policy analysis worldwide. Dr. Srinivasan's contributions extend to numerous studies evaluating the effects of agricultural practices, climate change, and land-use change on hydrology, water quality, and environmental sustainability. Through his decision support tools, he has transformed how watershed scientists and managers address environmental challenges and communicate solutions effectively to policymakers.

ABSTRACT

Climate Change Impact on Food and Water for the Next Generation

The change in the weather pattern and the high frequency of the occurrence of extreme events attributed to climate change has significantly impacted agricultural productivity, water availability, and the overall well-being of societies across the globe. Climate change's impact will worsen and challenge the next generation without proper mitigation strategies. Changes in climatic variables such as temperature, rainfall, and frost-free days may increase the growing seasons, which eventually have positive and negative implications in terms of prolonging the maturity period of the crops, enhancing high crop water requirements due to hotter seasons, and instigating the infestation of insects, weeds, and diseases that eventually affect the crop yield reduction and lack of food self-sufficiency. In addition, there is a high chance of heavy precipitation, which indirectly impacts agricultural productivity due to increased soil erosion and the depletion of soil nutrients. The nutrient can be transported to different water bodies, which deteriorates the water quality and depletes oxygen concentration, limiting water use. On the other hand, prolonged below-average seasonal rainfall could impact water availability for agricultural purposes and other uses such as domestic and industrial water supply.

Global warming is evident, and many regional climate models project an increase in temperature in many places. Thus, developing climate change mitigation strategies and adaptation options is crucial to conserving water resources and enhancing agricultural productivity. Hydrological models, such as the Soil and Water Assessment Tool (SWAT), can be used to study the impacts of climate change and the nexus between food productivity and water use. Scenario-based SWAT model simulation can give a better insight into quantifying the effects of climate change on different water balance components. The future projected climate data from the regional climate models (RCMs) can be potentially introduced in the calibrated baseline SWAT model to project future water availability and agricultural productivity to minimize the impacts of climate change through possible mitigation options.

KEYNOTE SPEAKER II

Jeffry Faizal Kamaruddin
Chief Operations Officer
Upstream Malaysia, Sime Darby Plantations Berhad
Email: jeffry.faizal@simedarbyplantation.com

Mr. Jeffry Faizal Kamaruddin is an accomplished professional with a remarkable career in the plantation industry. He began his journey after graduating from Universiti Pertanian Malaysia in 1989, where he laid the foundation for his future success. In 1990, he joined Kumpulan Guthrie Berhad as a palm oil engineer, marking the beginning of his illustrious tenure. Over the next 14 years, he honed his expertise and leadership skills, progressing through various roles, including senior engineer, senior assistant manager, manager, and senior manager, before earning a promotion to General Manager in 2004. Throughout his career, Mr. Jeffry has demonstrated exceptional versatility and a commitment to excellence. From 2007 to 2023, he managed diverse portfolios, serving as Head of Synergy & Transformation, Head of Mills Operations, Head of Selangor East Region, Head of Engineering, Regional Chief Executive Officer (RCEO) for Kalimantan Tengah and Johor, and Chief Upstream Business Support. These roles showcased his ability to drive innovation and foster collaboration across different sectors. Currently, Mr. Jeffry holds the esteemed position of Chief Operating Officer Upstream Malaysia at Sime Darby Plantation Berhad, where he continues to contribute his profound insights and strategic vision to steer the company towards unparalleled heights. His dedication and proficiency have undoubtedly left a lasting impact on the palm oil industry, making him a respected figure and an inspiration to aspiring professionals.

ABSTRACT

Managing Plantation Industry Recovery In The Post Pandemic World

The COVID-19 pandemic is a global health crisis that is already having devastating impacts on the world economy. The aftermath entails certain measures that have to be taken that will impact the business environment and how damaging these impacts turn out to be, such as a shortage of labour, food security, an increase in the cost of materials, and the livelihoods of the industry working along the food supply chain. Adding pressure to managing the shortage of labour, we are recognizing the increasing importance of human and labour rights, managing the consequences of the shock to the economy, and improving conditions under effective and efficient operations. While the pandemic poses some serious challenges for the food system in the short term, it is also an opportunity to accelerate new experiences and learnings and transforming the plantation sector to build its resilience in the face of a range of challenges, including food safety, operational safety, and hygienic and environmentally friendly (ESG) practices.

KEYNOTE SPEAKER III

Dr. Masao Gen
Associate Professor
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan
Email: mgen@tohoku.ac.jp

Dr. Gen obtained a doctoral degree in chemical engineering at Tokyo University of Agriculture and Technology in 2014. He worked as a postdoctoral researcher in material science at Tohoku University from 2014–2016 and as a research fellow at the City University of Hong Kong for almost four years afterwards. He is currently an assistant professor at Tohoku University. Before that, he was at Kanazawa University. He has over ten years of research experience in particle engineering and aerosol science. He specializes in spray drying, particle characterization, laser spectroscopy, multiphase processes of aerosols, and the secondary formation of aerosols in laboratory studies. His publications received the best paper award in the ACS journal *Environmental Science and Technology Letters* in 2019 and the best review paper award in 2022 in the RSC journal *Environmental Sciences: Atmosphere*.

ABSTRACT

Particle Engineering for Environmental Analysis

Intense economic and human activities result in air pollution emissions, including high levels of particulate matter in the atmosphere, or atmospheric aerosols. Atmospheric aerosol impacts regional air quality, human health, and climate change. Aerosol particles of submicrometer sizes (hereafter submicron) have a relatively long lifetime in the atmosphere and are one of the transboundary air pollutants. Aerosol particles can be deposited on plant surfaces, potentially affecting surface morphologies, growth, and physiological functions (e.g., photosynthesis). Hygroscopic aerosol particles deposited on leaf surfaces influence the gas exchange of water vapour and CO_2 on leaves. They also degrade epicuticular waxes and deteriorate the drought tolerance of plants.

On the other hand, plant leaves act as natural receptors for aerosol particles from the atmosphere. Vegetation can offer a physical barrier to air pollution mitigation. Thus, understanding aerosol-vegetation interactions is of great importance in ecosystems. Still, they remain elusive, partly due to the lack of suitable plant growth chamber systems for long-term exposure experiments. In my talk, I will present the design of a plant-growth chamber system integrated with two aerosol generators that can simultaneously grow plants under the control of humidity and temperature and expose submicron aerosol particles to the plants. In addition, I will introduce a novel spectroscopic technique for chemically characterizing environmental surfaces.

KEYNOTE SPEAKER IV

Datuk Dr. Ahmad Parveez bin Ghulam Kadir, *FASc.*
Director General
Malaysian Palm Oil Board
Email: parveez@mpob.gov.my

Datuk Dr. Ahmad Parveez is currently the Director General of the Malaysian Palm Oil Board (MPOB). He was appointed a Fellow of the Academy of Science Malaysia, a Member of the National Biosafety Board, and a Member of the Malaysian Agricultural Research and Development Institute (MARDI) Science Council. He is also an Adjunct Professor in the Department of Biological and Agricultural Engineering, Faculty of Engineering, University Putra Malaysia (UPM). Datuk Dr. Ahmad Parveez has 33 years of experience in Plant Molecular Biology, Genetic Engineering, and Biosafety. He successfully developed the world's first transgenic oil palm in 1997. His interests are in the genetic modification of oil palm, the biosafety of living-modified organisms, and oil palm sustainability. He was also given an honour to be the Chairman of the Genetic Modification Advisory Committee under the National Biosafety Board from 2010 until 2018.

ABSTRACT

Embracing Challenges and the Way Forward for Enhancing the Oil Palm Supply Chain in the Post-Pandemic Era

The agriculture industry in Malaysia serves as the country's economic engine. The nation's standing as the second-largest producer of oils and fats in the world was unaffected by the difficulties it faced in dealing with the post-COVID-19 outbreak. As a trading nation, it is pivotal for Malaysia to ensure the relevancy of our palm oil in the existing market as well as the prospect of venturing into new trade opportunities. In order to maintain the ecosystem supporting the oil palm industry, sustainability remains a top priority. The Malaysian Sustainable Palm Oil (MSPO) accreditation scheme's mandatory implementation has demonstrated effectiveness in demonstrating the highest commitment to sustainability. Malaysian palm oil and palm-based biomass will remain crucial in ensuring the security of the world's food supply. The effort to increase oil palm yield performance through new planting materials, good agricultural practices, and systematic pest and disease management is further enhanced. The industry is also actively moving toward advanced palm oil processing techniques that adhere to stringent, ever-changing trade regulations as well as standards for food safety and quality. Palm oil-based phytonutrients are actively valorized in the food health concept and nutraceutical segment to improve the image of palm oil and increase profits. Malaysia's oil palm industry commitment strategies and efforts to manage the challenges to move forward in the post-pandemic era will ensure our relevance in the future.

KEYNOTE SPEAKER V

Dr. Ryozo Noguchi
Professor
Graduate School of Agriculture, Kyoto University
Email: noguchi.ryozo.8j@kyoto-u.ac.jp

Ryozo Noguchi received his PhD from the Department of Agricultural Engineering, Faculty of Agriculture, Kyushu University, in 1993. He worked as an assistant professor at the University of Tsukuba, a visiting scholar at Michigan State University, an associate professor at Utsunomiya University, and an associate professor at the University of Tsukuba before being appointed professor at Kyoto University in 2022. He received the Academic Award from the Agricultural Informatics Society in 2015 and the Japan Association of the International Commission of Agricultural and Biosystems Engineering in 2023. He is currently researching system analysis and environmental impact assessment of biomass resource energy use in Japan and Southeast Asia. He also aims to integrate digital technology from smart pesticide application to environmental assessment in agriculture through the development of automated driving technology and pesticide sensing technology for the Speed Sprayer.

ABSTRACT

System Analysis and Environmental Impact Assessment for Food Production and Biological Resource Utilization

In agricultural food production and biomass utilization, it is important to design how resource circulation with energy use should be conducted, considering environmental issues and optimization by system analysis and environmental impact assessment. For Southeast Asia, including Japan, we have conducted some studies on future food production systems, biomass utilization systems, and waste management, which is considered to be a venous system. The research topics are ”Palm oil production including peat land use”, ”Contribution to local communities and the environment by controlling rice husk combustion”, and ”Assessment of resource and energy consumption and environmental impact of food production systems considering nutritional needs”. To reflect these results in the design of real society, it was clarified that it is important to incorporate the viewpoint of engineer ethics, and the intergenerational ethics unique to agricultural science by adding the viewpoint of the environment and living organisms through system analysis and environmental impact assessment of food production and use of biological resources.

CAFE*i*2023 PROGRAM DETAILS

OPENING CEREMONY

Day 1

16th August 2023 (Wednesday)

Time	Program
8.30 am – 9.00 am	CAFE*i*2023 Montage
9.00 am – 9.10 am	Recitation of Doa **Mr. Mohd Hafiz Ghazali**
9.10 am – 9.20 am	Welcoming Remarks by the Chairperson of the 6th International Conference on Agricultural and Food Engineering (CAFE*i*2023) **Assoc. Prof. Dr. Khairul Faezah Md Yunos**
9.20 am – 9.35 am	Opening Address by Vice Chancellor of Universiti Putra Malaysia **YBhg. Dato' Prof Dr. Roslan Sulaiman**
9.35 am – 9.40 am	Product Launching Ceremony
9.40 am – 10.00 am	**SESSION BREAK**

KEYNOTE SPEAKERS SESSION

Day 1

16th August 2023 (Wednesday)

Time	Program
	Chairperson: Prof. Dr. Khalina Abdan Co-Chair: Dr. Nazatul Shima Azmi Technical staff: Ts. Mr. Mohd Izhwan Muhamad
10.00 am - 10.50 am	**KEYNOTE 1:** **Prof. Dr. Raghavan Srinivasan** Texas A&M University *Climate Change Impact on Food and Water for the Next Generation*
	Chairperson: Prof. Ir. Dr. Yus Aniza Yusof Co-Chair: Dr. Nazatul Shima Azmi Technical staff: Ts. Mr. Mohd Izhwan Muhamad
10.50 am - 11.40 am	**KEYNOTE 2:** **Mr. Jeffry Faizal Kamaruddin** Sime Darby Plantation Berhad *Managing Plantation Industry Recovery in The Post-Pandemic World*
11.40 am - 12.30 pm	**KEYNOTE 3:** **Assoc. Prof. Dr. Masao Gen** Tohoku University *Particle Engineering for Environmental Analysis*
12.30 pm – 2.15 pm	**SESSION BREAK**

	Chairperson: Prof. Ts. Dr. Rosnah Shamsudin Co-Chair: Mr. Bomoi Muhammad Isa Technical staff: Ts. Mr. Mohd Izhwan Muhamad
14.15 pm – 3.00 pm	**KEYNOTE 4:** **Datuk Dr. Ahmad Parveez Hj Ghulam Kadir** Malaysian Palm Oil Board (MPOB) *Embracing Challenges and the Way Forward for Enhancing the Oil Palm Supply Chain in The Post-Pandemic Era*
3.05 pm – 3.50 pm	**KEYNOTE 5:** **Prof. Dr. Ryozo Noguchi** Kyoto University *System Analysis and Environmental Impact Assessment for Food Production and Biological Resource Utilization*

TECHNICAL SESSIONS AND CLOSING CEREMONY

Day 2

17th August 2023 (Thursday)

Time	Program
8.30 am – 4.15 pm	Oral Presentations of Technical Parallel Session (Detailed Itinerary is Given Below - Subject to Changes)
4.15 pm – 5.00 pm	Closing Remarks by Co-Chairperson of the 6th International Conference on Agricultural and Food Engineering (CAFE*i*2023) **Prof. Ir. Dr. Hasfalina Che Man** Announcement of CAFE*i*2023 Best Paper and Best Poster Awards

PARALLEL TECHNICAL SESSION
The 6th International Conference on Agricultural and Food Engineering (CAFE*i*2023)
17th August 2023

PARALLEL TECHNICAL SESSION 1				
Time: 8.30 am – 10.30 am	**ROOM A Agricultural Mechanization & Automation**	**ROOM B Food Security & Safety – Practical Approaches and Applications**	**ROOM C Soil & Water Management for Agriculture**	**ROOM D Emerging & Advances of Food Science, Technology and Engineering**
Chairperson:	**Chairperson**: Dr. Mohamad Firdza Mohamad Shukery **Co-Chair**: Miss Norfarina Bahari **Technical staff**: Mr. Zahiruddin Daud	**Chairperson**: Prof. Ir. Dr. Siti Mazlina Mustapa Kamal **Co-Chair**: Miss Sudau Eh Tee **Technical staff**: Mr. Zainal Abidin Abdul Ghani	**Chairperson**: Assoc. Prof. Dr. Aimrun Waiyayok **Co-Chair**: Miss Nurul'azah Mohd Yaakub **Technical staff**: Mr. Mohd. Sabri Hassan	**Chairperson**: Assoc. Prof. Dr. Mohd Shamsul Anuar **Co-Chair**: Miss Mazween Mohamad Mazlan **Technical staff**: Mr. Muhammad Azlan Othman
8.30 am - 8.45 am	**CAFEi2023: 052-026** PERFORMANCE EVALUATION OF SOLAR DRYER FOR MULLET FISH: THE IMPLEMENTATION OF IOT BASED MONITORING SYSTEM **Ghafar, H.**, Rusli, W. A. W., Ismail, M. A., Abdul Nasir. S. M.F.S, Yamin, A. F. M. and Yusoff, H. **Presenter: Halim Ghafar**	**CAFEi2023: 161-138** FABRICATION OF CHITOSAN-BASED NANOCOMPOSITE MEMBRANE: EFFECT OF MICROWAVE-TREATED-LOADED CHITOSAN NANOPARTICLES ON THE EFFICIENT CAPTURING OF METHYLENE BLUE DYES FROM AQUEOUS SOLUTION Katibi, K.K., **Md Yunos, K. F.**, and Othman, S. H., **Presenter: Kamil Kayode Katibi**	**CAFEi2023: 102-085** USE OF KEKE EMITTER IN DRIP IRRIGATION SYSTEM **Abubakar, S. I.,** and Abdullahi, A. S. **Presenter: Sani Isa Abu Bakar**	**CAFEi2023: 107-098** THE EFFECT OF GREEN SPINACH (*AMARANTHUS VIRIDIS* L.) CONCENTRATION TOWARDS PHYSICOCHEMICAL CHARACTERISTICS OF SHIRATAKI NOODLES MADE FROM PORANG FLOUR **Hermanto, M. B**., Yulianingsih, R., and Indah, A. A. **Presenter: Mochamad Bagus Hermanto**

8.45 am - 9.00 am	**CAFEi2023: 128-114** EARLY DESIGN OF MECHANISED PINEAPPLE TRANSPLANTER USING PNEUMATIC Saharrudin, A. S., **Mahadi, M. R**., Kassim, M. S. M., Hasan, W. Z. W. **Presenter: Ahmad Safiuddin Saharrudin**	**CAFEi2023: 075-063** HEALTH RISK ASSESSMENT OF ARSENIC AND IRON IN COMMERCIAL WHITE AND BROWN RICE IN MALAYSIA **Navaretnam, R.,** Ahmad Zaharin Aris, A. Z., and Ley. J. Y. **Presenter: Raneesha Navaretnam**	**CAFEi2023: 143-123** HYDRAULIC RAM PUMP DEVELOPMENT FOR SMALL IRRIGATION SYSTEM IN UPLAND BARANGAYS **Ma. Grace C. Sumaria**, M. G. C., Lua, J. B., and Guarte, R. C. **Presenter: Ma. Grace C. Sumaria**	**CAFEi2023: 059-044** APPLICATION OF ARTIFICIAL NEURAL NETWORKS FOR CLASSIFYING EARTHWORMS (*EUDRILUS EUGENIAE*) MOISTURE CONTENT DURING THE DRYING PROCESS **Hendrawan, Y**., Mei Lusi Ambarwati, M. L., Lastriyanto, A., Damayanti, R., Al Riza, D. F., Hermanto, M. B., and Sutan, S. M. **Presenter: Yusuf Hendrawan**

9.00 am - 9.15 am	**CAFEi2023: 097-077** TESTING AND EVALUATION OF NEWLY DEVELOPED HARVESTING BASKET AMONG MALE PINEAPPLE HARVESTERS IN JOHOR, MALAYSIA Suhaimi, S. N. A., **Abidin, E. Z.**, Malek, M. H., Ismail, S. N. S., Rasdi, I., Karuppiah, K. and Ismail. N. H. **Presenter: Emilia Zainal Abidin**	**CAFEi2023: 085-056** MITIGATING 3-MONOCHLOROPROPANE-1,2-DIOL AND MINERAL OIL HYDROCARBON (MOH) CONTAMINANTS IN PALM PRODUCTION OIL USING HOT WATER DILUTION Hilmi, S. M. H. S., Md Rejab, S. A., Siran, Y. M., Ngteni, R., Saparin, N., and **Zulkurnain, M**. **Presenter: Syed Mohd Hadi Syed Hilmi**	**CAFEi2023: 146-127** COMPARATIVE EVALUATION OF SUITABILITY ASSESSMENT OF THE TAGUIBO RIVER IRRIGATION SYSTEM DIVERSION DAM **Bocobo, A. E.,** Ariston, J. V., Ungab, C. D. D., Cacayan Jr., A. O., and Apdohan, A. G. **Presenter: Aljon E. Bocobo**	**CAFEi2023: 040-115** BIOACTIVE COMPOUNDS RECOVERY FROM *MORINDA CITRIFOLIA* LEAVES USING CITRIC ACID-CATALYZED ULTRASONIC EXTRACTION Baharin, A. N., **Mohd Thani, N.**, and Mustapa Kamal, S. M. **Presenter: Nurfatimah Mohd Thani**
9.15 am - 9.30 am	**CAFEi2023: 164-140** CORDLESS PALM OIL CUTTER, P-1 FOR SMALL HOLDER'S PLANTATION Yusof, A.H. A., **Mat Akir, R.,** and Md Yusop, N. **Presenter: Ahmad Haziq Ahmad Yusof**	**CAFEi2023: 064-040** COMPARISON OF PADDY CULTIVATION MEDIA USING HYDROPONIC SYSTEM **Suhaili, W. S**., Shams, S., Peng, A. S., Hamdani, A., and Isa, M. H. **Presenter: Mohammad Arif Mohammad Hamdani**	**CAFEi2023: 095-084** APPLICATION OF GIS AND SWAT HYDROLOGICAL MODEL FOR ASSESSING WATER YIELD AT TAGUIBO RIVER WATERSHED FOREST RESERVE (TRWFR), BUTUAN CITY, PHILIPPINES **Bocobo, A. E.,** Lajera, K. J. P., Simbolas, F. H. A., Cacayan Jr., A. O., and Apdohan, A. G. **Presenter: Aljon E. Bocobo**	**CAFEi2023: 096-076** DETECTION OF PORK ADULTERATION IN BEEF AND MUTTON USING VISIBLE NEAR-INFRARED (VIS-NIR) COUPLED WITH CHEMOMETRICS Zahroh, A., Pahlawan, M. F. R., Rahmawati, L., and **Masithoh, R. E.** **Presenter: Rudiati Evi Masithoh**

9.30 am - 9.45 am	**CAFEi2023: 002-002** DEVELOPMENT AND TESTING OF A TRICYCLE CASSAVA HARVESTER **Gana, I.M.,** Mohammed U, Mohammed I. B., Udeh E, Salami O **Presenter: Ibrahim Mohammed Gana**	**CAFEi2023: 126-112** AGRIVOLTAIC CHICKEN FARMING AS A SUSTAINABLE SOLUTION IN URBAN COMMUNITY **Ya'acob, M. E.**, and Othman, N. F. **Presenter: Mohammad Effendy Ya'acob**		**CAFEi2023: 141-121** DEVELOPMENT AND QUALITY EVALUATION OF ASAM LAKSA-FLAVORED MUSHROOM SNACKS PREPARED BY AIR FRYING **Wah, C. S.,** Nee, T, J., and Singaram, N. **Presenter: Chan Sook Wah**
9.45 am - 10.00 am	**CAFEi2023: 002-003** DESIGN, FABRICATION AND TESTING OF A DOUBLE - ROW TRACTOR MOUNTED POTATO DIGGER-CONVEYOR Shiru J. J., **Gana, I.M.**, Aliyu E. O., E. J., Ahmed R. O., Ekwe N. B., and Akpo C. O. **Presenter: Shiru J. J.**			**CAFEi2023: 117-093** EXTRUSION-BASED 3D FOOD PRINTING: PRINTABILITY ASSESSMENT ON THE EFFECT OF PROCESS PARAMETERS OF WHITE CHOCOLATE **Parid, D.M**., Baharuddin, A. S., Rahman, N. A. A., Mohammed, M. A. P., and Wakisaka, M. **Presenter: Dzieda Muhamad Parid**
10.00 am - 10.30 am	**Q & A SESSION**			
10.30 am - 10.45 am	**SESSION BREAK**			
PARALLEL TECHNICAL SESSION 2				

Time: 10.45 am - 12.45 pm	ROOM A: Agricultural Automation & Smart Farming	ROOM B: Emerging Postharvest Engineering & Technology	ROOM C: Management & Technology Utilisation for Food and Agricultural Waste	ROOM D: Emerging & Advances of Food Science, Technology and Engineering
Chairperson:	**Chairperson**: Dr. Muhammad Saufi Muhamad Kassim **Co-Chair**: Miss Norfarina Bahari **Technical staff**: Mr. Zahiruddin Daud	**Chairperson**: Ts. Dr. Muhammad Hazwan Hamzah **Co-Chair**: Miss Sudau Eh Tee **Technical staff**: Mr. Zainal Abidin Abdul Ghani	**Chairperson**: Assoc. Prof. Dr. Rosnita A. Talib **Co-Chair**: Miss Mazween Mohamad Mazlan **Technical staff**: Mr. Mohd. Sabri Hassan	**Chairperson**: Assoc. Prof. Dr. Farah Saleena Taip **Co-Chair**: Dr. Kamil Kayode Katibi **Technical staff**: Mr. Muhammad Azlan Othman
10.45 am - 11.00 am	**CAFEi2023: 035-034** DESIGN CONCEPT OF SMART HERBICIDE SPRAYING MOBILE ROBOT FOR INDOOR FARMING Mansor, A. N., **El Pebrian, D**., and Zahari, M. K. **Presenter: Ahmad Nasruddin Mansor**	**CAFEi2023: 133-134** EFFECT OF HYDROGEN PEROXIDE AND SODIUM ALCOHOL ETHER SULPHATE ON THE COMPRESSIVE STRENGTH AND TOTAL POROSITY OF POROUS RICE HUSK ASH-BASED GEOPOLYMER FOAM **Basri, M. S. M**., Othman, S. H., Mohammed, M. A. P., Mazlan, N., and Kamarudin, S. H. **Presenter: Mohd Salahuddin Mohd Basri**	**CAFEi2023: 037-018** LIQUID BIPHASIC FLOTATION SYSTEM (LBFS) FOR SEPARATION OF PROTEIN FROM AZOLLA PINNATA Kobbin, K., Peter, A. P., **Mohd Nor, M. Z**., and Show, P. L. **Presenter: Kiishhen Kobbin**	**CAFEi2023: 147-128** THE CRUST FORMATION AND CONDUCTIVE HEAT TRANSFER COEFFICIENT RELATIONSHIP OF IN-HOUSE FORMULATED DOUGH IN THE DEEP-FRYING PROCESS Solehan, N. S., M., **Naim, M. N.,** and Abu Bakar, N. F. **Presenter: Mohd Nazli Naim**

11.00-11.15	**CAFEi2023: 100-083** EVALUATION OF STATIC AND DYNAMIC ARRANGEMENT LIGHT EMITTING DIODE (LED) ON ROCKMELON GROWTH Nordin , N. M., **Jamaludin, D.,** and Abd Aziz, S. **Presenter: Diyana Jamaludin**	**CAFEi2023: 138-131** EFFECT OF DRYING TEMPERATURE ON THE PHYSICO-CHEMICAL PROPERTIES OF LAWSONIA INERMIS L. (HENNA) POWDER Abel, S. E. R., Azhar, N. A. R. M., Salim, H. S., and **Yusof, Y. A.** **Presenter: Yus Aniza Yusof**	**CAFEi2023: 101-101** ASSESSING HEAVY METAL ACCUMULATION IN AGRICULTURAL CROPS IN A NICKEL MINING SITE IN AGUSAN DEL NORTE **Capilitan, J. J.,** Tabañag, I. D. F., and Evelyn B. Taboada, E. B. **Presenter: Jobelle J. Capilitan**	**CAFEi2023: 049-025** EFFECTS OF MIXING-GRINDING PARAMETERS ON THE QUALITY ATTRIBUTES OF HERBAL (ULAM RAJA AND HABBATUS SAUDA) DRINK POWDERS Effendy, N. I. M. H., Basri, M. S. M., Yusof, Y. A., Baharuddin, A. S., and **Abd Rahman, N. A.** **Presenter: Nur Aliaa Binti Abd Rahman**
11.15 am - 11.30 am	**CAFEi2023: 163-139** ASSESSING THE IMPACT OF ENVIRONMENTAL VARIABLES ON THE GROWTH PERFORMANCE OF COCOS NUCIFERA IN A TROPICAL ROOFTOP NURSERY SETTING **Sulaiman, A. S. S.** **Presenter: Ahmad Syafik Suraidi Sulaiman**	**CAFEi2023: 021-108** ADVANCING FOOD-DRYING TECHNIQUES: DESIGN AND PERFORMANCE OF A MULTI-LAYERED DRYING RACK Ab Aziz, I. F., **Che Man, H.** Shamsudin, R., Ismail, M. F. S., and Bathumaly, S. **Presenter: Sangitha Bathumaly**	**CAFEi2023: 084-062** EVALUATING THE EFFECT OF LOW AND HIGH TEMPERATURE MODE OF SUBCRITICAL WATER PRE-TREATED EMPTY FRUIT BUNCHES ON CO-DIGESTION PERFORMANCE AND KINETIC STUDY FOR BIOGAS PRODUCTION Hamzah, A. F. A. **Hamzah, M. H.,** Che Man, H., Khairudin, N., Ismail, M. H., and Show, P. L. **Presenter: Adila Fazliyana Aili Hamzah**	**CAFEi2023: 065-039** STORAGE STABILITY OF ELECTROLYZED OXIDIZING WATER AND ITS PROPERTIES AFTER WASHING HONEYDEW FRUITS **Ab Aziz, N.,** Jasni, M. F. A., Sulaiman, N. S., Chen, K. G., and Khalid, N. I. **Presenter: Norashikin Ab Aziz**

11.30 am - 11.45 am		**CAFEi2023: 150-130** MILP MODEL FOR OPTIMAL CONVERSION OF FOOD WASTE INTO POULTRY PELLET Yusof, N. N., **Shukery, M. F. M.** and Che Man, H. **Presenter: Mohamad Firdza Mohamad Shukery**	**CAFEi2023: 077-050** PERFORMANCE EVALUATION OF MORINGA OLEIFERA AS COAGULANT FOR ABATTOIR WASTEWATER TREATMENT **Adesiji A. R,** Hassa, M., Odekunle, M. O., Asogwa, E.O. And Mangey J. A. **Presenter: Adesiji Adeolu Richard**	**CAFEi2023: 026-051** OPTIMIZATION OF NON-THERMAL ULTRASONICATION PROCESS FOR RETAINING NUTRITIONAL QUALITY IN MILK: EFFECTS OF FAT PERCENTAGE AND PROCESSING PARAMETERS Mohd. Yaakub, N., Mustapa Kamal, S. M., Chin, N. L., Julmohammad, N., **Sulaiman, A.**, Therdthai, N. **Presenter: Nurul'azah Mohd Yaakub**
11.45 am - 12.00 pm		**CAFEi2023: 172-147** ESTIMATING AN EUCALYPTUS HYBRID *(E. GRANDIS* X *E. UROPHYLLA*) FUEL WOOD AS A BIOMASS SOURCES FOR THE 10 MW DENDRO POWER GENERATION PLANT **Muhamad,M. I.**, Hizam, H., Radzi, M. A. M., Othman, M. L. O., Gomes, C., and Abdu, A. **Presenter: Mohd Izhwan Bin Muhamad**		**CAFEi2023: 091-068** THE EFFECT OF FERMENTATION ON COCOA BEAN PROPERTIES USING A COMPACT FERMENTATION CONTAINER WITH A STIRRING MECHANISM **Siti Mariyam**, Saputro, A. D., Aulia, N. I., Asyahidah, I. N., and Kusuma, M. T. A. H **Presenter: Siti Mariyam**
12.00 pm - 12.20 pm	**Q & A SESSION**			
12.20 pm - 14.15 pm	**LUNCH BREAK**			

PARALLEL TECHNICAL SESSION 3				
Time: 2.15 pm - 4.15 pm	**ROOM A Machine Vision Applications**		**ROOM C Advanced Processing System for Agricultural Materials**	**ROOM D Packaging Engineering**
Chairperson:	**Chairperson**: Dr. Nur Azuan Husin **Co-Chair**: Dr. Kamil Kayode Katibi **Technical staff**: Mr. Shahrulrizal Zakaria		**Chairperson**: Dr. Alifdalino Sulaiman **Co-Chair**: Miss Norfarina Bahari **Technical staff**: Mr. Noorazelan Mohd Noor	**Chairperson**: Dr. Nur Hamizah Abd Ghani **Co-Chair**: Dr. Nazatul Shima Azmi **Technical staff**: Ts. Dr. Mohd Salahuddin Mohd Basri
2.15 pm - 2.30 pm	**CAFEi2023: 060-060** MATURITY LEVEL PREDICTION AND CLASSIFICATION OF LEMON FRUIT (CITRUS LIMON CV. MONTAJI AGRIHORTI) USING COMBINED REFLECTANCE-FLUORESCENCE COMPUTER VISION AND MACHINE LEARNING MODELS Laila, I. R., Tulsi, A. A., Susilo, B., and **Al Riza, D. F.** **Presenter: Indah Rustiani Laila**		**CAFEi2023: 068-043** ENHANCING THE EFFICIENCY OF INFRARED DRYING OF DESICCATED COCONUT THROUGH PROCESS OPTIMIZATION AND VALIDATION Sahari, Y, **Anuar, M. S**., Mohd Nor, M. Z., and Abdul Ghani N. H. **Presenter: Yahya Sahari**	**CAFEi2023: 046-082** EFFECT OF SONICATION TIME ON PHYSICOCHEMICAL AND MECHANICAL PROPERTIES OF PURPLE SWEET POTATO STARCH AND PEEL-BASED PH INDICATOR FILMS **Sohany, M.,** Tawakkal, I. S. M. A., Shah, N. N. A. K., Othman, S. H. and Yusof, Y. A. **Presenter: Mouluda Sohany**

2.30 pm - 2.45 pm	**CAFEi2023: 022-012** CHARACTERISATION OF PHYSICOCHEMICAL PROPERTIES OF MANGO INFECTED BY *COLLETOTRICHUM GLOEOSPORIOIDES* Eh Teet, S., **Hashim, N.,** Siti Khairunniza Bejo, S. N., Ismail, S. N., and Ali, M. M. **Presenter: Sudau Eh Teet**		**CAFEi2023: 056-033** EVALUATION OF GALLIC ACID FROM PIPER BETLE LINN LEAVES EXTRACT: A SUBCRITICAL WATER HYDROLYSIS STUDY Rahmah, N. R., Sulaiman, A., Taip, F. S., Izhar, S., and **Kamal, S. M. M.** **Presenter: Nur Lailatul Rahmah**	**CAFEi2023: 045-067** NANOENCAPSULATION OF THYMOL IN CHITOSAN NANOPARTICLE ON POLY (LACTIC ACID)/ POLY (BUTYLENE SUCCINATE)/NANOFIBRILLATED CELLULOSE (PLA/PBS/NFC) FOR ACTIVE FOOD PACKAGING APPLICATION Zabidi, N.A., **Tawakkal, I.S.M.A.**, Ariffin S.H., and Naim M.N. **Presenter: Nurul 'Afifah Zabidi**
2.45 pm - 3.00 pm	**CAFEi2023: 020-036** COMPUTER VISION FOR MONITORING GLUTINOUS RICE QUALITY DURING STORAGE **Ageh, O**., Hashim, N., Mohd Ali, M., and Jimoh, K. A. **Presenter: Ageh Opeyemi Micheal**		**CAFEi2023: 016-028** TIME-TEMPERATURE DEPENDENT MODELLING OF THE THIN-LAYER DRYING KINETICS OF GLUTINOUS RICE **Jimoh, K. A**., Hashim, N., Shamshudin, R., Che Man, H., and Jahari, M. **Presenter: Kabiru Ayobami Jimoh**	**CAFEi2023: 120-141** CONTROLLED RELEASE AND ANTIBACTERIAL ACTIVITY OF CORN STARCH-BASED FILMS CONTAINING NANOCELLULOSE AND THYMOL Nordin, N., **Othman, S. H.,** Basha, R. K., and Rashid, S. A. **Presenter: Norhazirah Nordin**

3.00 pm - 3.15 pm	**CAFEi2023: 152-129** COMPREHENSIVE RICE MAPPING USING UAV IMAGERY AND GIS ANALYSIS FOR CROP MONITORING Halip, R. M., **Che'Ya, N. N., Ilahi, W. F**., Berahim, M. R. I. Z., Omar, M. H. and Roslee, R. **Presenter: Rowena Mat Halip**		**CAFEi2023: 007-007** KINETICS OF DIMENSIONAL CHANGES OF WHITE GLUTINOUS RICE DURING SOAKING Azman, P. N. M. A., **Shamsudin, R.**, Hashim, N., and Che Man, H. **Presenter: Puteri Nurain Megat Ahmad Azman**	
3.15 pm - 3.30 pm	**CAFEi2023: 127-113** AUTOMATIC COUNTING OF PAULOWNIA TREE USING UAV IMAGES AND TEMPLATE MATCHING TECHNIQUE Wan Muhamad Baqir bin Mahdi, W. M. B., **Khairunniza-Bejo, S.** and Zahari, M. N. **Presenter: Siti Khairunniza-Bejo**		**CAFEi2023: 031-061** EFFECT OF INULIN AND XANTHAN GUM ON THE RHEOLOGICAL PROPERTIES AND 3D PRINTING BEHAVIOR OF TARTARY BUCKWHEAT PASTE Li, Y. J., Ho, A. H., Sylvester, M., and **Lee, J. S.** **Presenter: Li Yaojia**	
3.30 pm – 3.45 pm	**Q & A SESSION**			
4.15 – 5.00 pm	**CLOSING CEREMONY**			

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Paper ID & Paper Title	Authors & Presenter	Sub-Themes
CAFEi2023: 125-110 Conceptual Design Improvement and Assessment of an Oil Palm Harvesting Machine via Computer-Aided Design Software	**Ramli, A. S**., Bakri, M. A. M., Ahmad, M. R., Mustafa, N. K., and Thaddeus, D. J. **Presenter:** **Ahmad Syazwan Ramli**	Agricultural Mechanization and Automation
CAFEi2023: 004-023 Green Synthesis of Zinc Oxide Nanoparticles using Stingless Bee Honey	Rozman, A. S., **Hashim, N**. Maringgal, B., Tawakkal, I. S. M. A., Khalina Abdan, K., and Sabarudin, A. **Presenter:** **Azri Shahir Rozman**	Agricultural Processing
CAFEi2023: 019-024 Life Cycle Assessment (LCA) of Greenhouse Gas Emission from Fertilizer Application in Rice Production in Malaysia	Lee, K. L., **Hashim, N**., Mohidem N. A., and Ahmad, A. **Presenter:** **Lee Kian Lie**	Agricultural Processing
CAFEi2023: 082-054 Fracture Analysis of Polypropylene Nano Clay Bamboo Fibre	**Othman, M. H**., Zulfadhli, M. Z. M., and Sulor, M. A. **Presenter:** **Mohd Hilmi Othman**	Agricultural Processing
CAFEi2023: 089-079 Preparation of Essential Oil Nanoemulsions and Its Incorporation in Chitosan–Based Edible Coating on Guava	Ghazali N. S. M., and **Zakaria, R.** **Presenter:** **Rabitah Zakaria**	Agricultural Processing
CAFEi2023: 090-066 Linear Regression and Machine Learning Modeling for Chlorophyll Content Estimation using Leaf RGB Images	Nasoha, N Z., Ibrahim N. U. A., Harith, H. H., Jamaludin, D., and **Abd Aziz, S.** **Presenter:** **Samsuzana Abd Aziz**	Bioinformation System
CAFEi2023: 041-136 Xylitol Production Via Fermentation By Candida Tropicalis With The Effect Of Temperature And Ph	Mohamad, N. L., **Kamal, S. M. M.**, Mokhtar, M. N. Abdullah, N., and Hussain, S. A. **Presenter:** **Siti Mazlina Mustapa Kamal**	Bioprocess and Environment
CAFEi2023: 105-089 The Influence of Microwave Drying and Rehydration Kinetics of *Acanthus ilicifolius* Leaves in Tea Production	**Salleh, F. S. M**., Yasir, N. N., and Ghani, N.H, **Presenter:** **Faiqa Shazeaa Mohd Salleh**	Drying Technology
CAFEi2023: 086-057 Bioactivity and Chemical Properties of Watermelon Cultured Drink using Probiotic Strain of *Lactobacilli*	**Adnan, H.,** Sa'adom, N. B., Hashim, H., Che-Hussin, N. E., and Teoh, C. H. **Presenter:** **Hazniza Adnan**	Fermentation Technology
CAFEi2023: 006-027 Green Synthesis of Silver and Zinc Oxide Nanoparticles using Stingless Bee Honey	**Bahari, N.,** Hashim, N. Abdan, K., Akim, A. M., Maringgal, B., and Al-Shdifat, L. **Presenter:** **Norfarina Bahari**	Food and Agricultural
CAFEi2023: 039-073 The Textural Modification for 3D Printed Meat and Seafood: A Mini Review	**Khalid, N. I**., Noh, T. U., and Ali, M. M. **Presenter:** **Nurul Izzah Khalid**	Food and Agricultural

CAFEi2023: 115-099 Quality and Shelf-Life Performance of Starfruit Cv. Bintang Mas at Different Maturity Indexes using Spirulina and Chitosan Edible Coatings	Shapawi, Z. A., **Ariffin, S. H.**, Shamsudin, R. How, S., and Baharom, A. H. **Presenter:** **Zahrah-Izati Azhar Shapawi**	Food and Agricultural
CAFEi2023: 142-122 Sugar Extraction from Bamboo Shoot via Enzymatic Hydrolysis	Harun, S. H. A., **Ghani, W. A. W. A. K**., and Mustapa Kamal, S. M. **Presenter:** **Siti Hana Alisa Harun**	Food and Agricultural
CAFEi2023: 024-015 Elucidating Ultrasonic and Ozone Treatment for Purple Sweet Potato Starch Modification	**Shah, N. N. A. K.**, Sabri, N., Tawakkal, I. S. M. A., and Yusof, Y. A. **Presenter:** **Nor Nadiah Abdul Karim Shah**	Food Processing
CAFEi2023: 001-055 Valorization of Spent Coffee Ground (SCG) for Scented Candle Production	Azhar, N. A. R. M., **Taip, F. S.**, Hashim, N. H., and Rahman, N. A. A. **Presenter:** **Farah Saleena Taip**	Food Processing
CAFEi2023: 012-064 From Tradition to Convenience: Using Sausage Technology to Bring Malaysian Banana-Based Desserts to the Masses	Husaini, H., **Nor, M. Z. M.**, Talib, R. A., Hasnan, N. Z. N., Hamzah, M. H., and Jusoh, J. M. **Presenter:** **Mohd Zuhair Mohd Nor**	Food Processing
CAFEi2023: 053-102 Effect of Different Storage Temperatures on the Physicochemical, Phenolic Content and Microbiological Qualities of the Reconstituted Pomegranate Juice (RPJ) After Thermal and Aseptic Processing	Lee, W. S., Farid, A. F. M., **Hasnan, N. Z. N.**, Alyas, N. D., Zulkifli, N. I. M., Basha, R. K., Ab. Aziz, N., and Salleh, F. S. M. **Presenter:** **Noor Zafira Noor Hasnan**	Food Processing
CAFEi2023: 139-119 Semi-Finished Meat Product Fortified by Lentil Flour	Urazbayeva K. A., Alibekov, R.S., **Gabrilyants, E.A.,** Kassymova, M. K., Kobzhasarova, Z.I., and Tursynbay, L.M. **Presenter:** **Urazbayeva K. A.**	Food Processing
CAFEi2023: 144-124 Functional Corn - Based Product	Alibekov, R.S., **Aitbayeva A. Zh**.,Taip, F. S., Azimov, A.M., Bahtybekova A.R., and Satayev B.M. **Presenter:** **Alibekov R.S.**	Food Processing
CAFEi2023: 079-052 The Effect of Adding *Garcinia atroviridis* on pH, Colour and Antioxidant Properties of Roselle Tisane	**Tun Norbrillinda, M.,** Norra, I., and Helmi, M. M. A. **Presenter:** **Tun Norbrillinda, M.**	Food Processing
CAFEi2023: 093-090 Microwave Heat Treatment of Glutinous Rice Emping	**Dom, Z. M.**, Nordin, M. I., and Shamsudin, R. **Presenter:** **Zanariah Mohd Dom**	Food Processing

CAFEi2023: 033-106 Evaluation of Erythritol Production from Bakery Waste Hydrolysate using *Yarrowia Lipolytica*	Roshara'madan, E. N, **Mustapa Kamal, S.M.**, Sulaiman A., and Taip, F.S. **Presenter:** **Ezyan Nazeefa Roshara'madan**	Food Processing
CAFEi2023: 048-072 Nanoencapsulation of Anthocyanins for Active and Intelligent Biodegradable Packaging Films	Yusof, N. N. M., and **Tawakkal, I. S. M. A.** **Presenter:** **Nurul Nadzirah Mohd Yusof**	Packaging Engineering
CAFEi2023: 025-074 Characterization of pH-Sensitive Sugar Palm Starch Films Loaded with Anthocyanin for Smart Food Packaging Application	Asmadi, F. A., Sohany, M., Hamidon, N. K., and **Tawakkal, I.S.M.A**. **Presenter:** **Intan Syafinaz Mohamed Amin Tawakkal**	Packaging Engineering
CAFEi2023: 050-091 Characterization of Patchouli Essential Oils Loaded-Chitosan Nanoparticles	Asmadi, F. A., **Tawakkal, I. S. M. A**., Talib, R. A., Othman, S. H., and Basri, M. S. M. **Presenter:** **Farhana Azmira Asmadi**	Packaging Engineering
CAFEi2023: 119-096 Water Stimuli Responsive Self-Healing Properties of Red Tilapias Fish Scale Gelatin-Based Film	Azmi, N. S., **Basha, R. K.,** and Amin, N. A. M. **Presenter:** **Roseliza Kadir Basha**	Packaging Engineering
CAFEi2023: 043-120 Particle Size, Density, Flowability, Colour and Surface Oil Content of Desiccated Coconut Obtained from Oven, Microwave and Air Fryer Drying Processes	Heng, H. Y., **Anuar, M. S.**, Sahari, Y., Nor, M. Z. M., Nur Hamizah Abdul Ghani, N. H. A., and Tahir, S. M. **Presenter:** **Mohd Shamsul Anuar**	Particle and Powder Technology
CAFEi2023: 124-104 Exploring the Impact of Physical Properties on Biopolymer Performance in Biomedical Applications	**Al-Ibraheemi, Z. A. M.**, Mahdi, A. B., and Mousa, A. A. **Presenter:** **Ali Basim Mahdi**	Particle and Powder Technology
CAFEi2023: 018-032 Modelling of Mass and Mechanical Properties of Papaya for Optimal Handling in Supply Chain Operation	Aina, A. M., **Harith, H. H.**, Hashim, N., and Shukery, M. F.M. **Presenter:** **Ademola M. Aina**	Postharvest Engineering and Technology
CAFEi2023: 094-075 Watermelon Postharvest and Process Engineering System	**Sairi, M.**, Shafie, Z., Noh, B. M., Azman, W. M. F. W., Hasbullah, H. H., Azizan, S. A., Rahim, A. A., Razali, N. A., and Teoh, C. C. **Presenter:** **Masniza Sairi**	Postharvest Engineering and Technology
CAFEi2023: 044-020 Effect of Vacuum Impregnation with Melatonin, Aminobutyric Acid, and Oxalic Acid on Chilling Injury and Quality of Carambola	Yusof, F. A. M., Azman, E. M., Adzahan, N. M., and **Yusof, N. L.** **Presenter:** **Farah Anum Mohd Yusof**	Postharvest Engineering and Technology
CAFEi2023: 114-100 The Effect of Different Pre-Treatments and Drying Method on the Nutritional Quality of Pegaga (*Centella asiatica* L.) Leaves	Yunos, N. M., **Ariffin, S. H.**, Yusof, Y. A., and Salleh, F. S. M. **Presenter:** **Nazurah Mohd Yunos**	Postharvest Engineering and Technology

CAFEi2023: 069-046 Effect of Variety and Supplemental Irrigation on Potato Productivity in Kuru, Jos Nigeria	**Dayok, S.T.**, Deshi, S.N., and Goyit, I. **Presenter:** **Dayok S.T**	Process Control and Integration
CAFEi2023: 098-078 Effect of Composite Technologies on the Mechanical Properties and Biodegradability of Agricultural Polymeric Materials	**Sam, N. S. M**., Krishnen, G., Baharulrazi, Abdullah, L. C., and Majid, R. A. **Presenter:** **Nor Syahidah Md Sam**	Safety and Health in Agriculture
CAFEi2023: 103-086 Comparison of Total Phenolic Content, Total Flavonoid Content and Antioxidant Activity of White Mulberry (*Morus alba*) Leaves and Roots Extracted using 80% Ethanol and Water	**Azlan, A.,** and Joanne, N. Y. C. **Presenter:** **Joanne Ng Yin Chyi**	Safety and Health in Agriculture
CAFEi2023: 122-107 Application of Terrestrial Lidar in Soybean Crop	**Husin, N. H**., and Mishonov, A. **Presenter:** **Nur Azuan Husin**	Smart Farming Technology
CAFEi2023: 090-065 A Web-Based IOT Monitoring and Service System for Agricultural Applications	Ee, Z. E., Harith, H. H., Jamaludin, D., and **Aziz, S. A.** **Presenter:** **Samsuzana Abd Aziz**	Smart Farming Technology
CAFEi2023: 129-116 Wireless Water Level Detection System	**Toridi, N. M.**, Ramli, N. M., Khairudin, N., Muhammad Idham Haiqal, A., Muhammad Shamir, M. H., Nur Shafiqah, I., and Anelka Dau, K. **Presenter:** **Noorellimia Mat Toridi**	Soil and Water Engineering
CAFEi2023: 129-142 Assessment of Nitrate Contamination Contribution in Shallow Groundwater for Dairy Operations	**Toridi, N.M.,** Azwan, M.M.Z., Yusuf, B., Lasan, V.B.R., Makzin, N., Mohammad Nazri, E., Norulhuda, M.R., and Rowshon, M.K. **Presenter:** **Noorellimia Mat Toridi**	Soil and Water Engineering
CAFEi2023: 113-097 Evaluation of the Cucumber-Starter (Cu-S) Performance in Accelerating Food Waste Composting	Raimi, H. S. M., **Ismail, T. N. H. T.**, Ali, R., Najib, M. Z. M., Yuriz, Y., and Jais, T. **Presenter:** **Halimatus Saadiah Mohamed Raimi**	Waste Management
CAFEi2023: 088-059 Investigation on the Tensile Strength and Thermal Properties of the Transparent Wood for Ultraviolet Resistance	Chong, P. E., and **Othman, S. A.** **Presenter:** **Siti Amira Othman**	Waste Management
CAFEi2023: 158-135 The Importance of Ammonia Removal Process in Aquaculture Systems" Towards Improving Malaysian Aquaculture Production	**Ramli, N. M**., de Cruz, C. R., and Prapti, D. R. **Presenter:** **Nurolhuda Mohamed Ramli**	Waste Management
CAFEi2023: 038-103 Exploring the Relationship Between Sensory Profiles of Coffee Brews and Their Brewing Methods	**Ghani, N. H. A.**, Taip, F. S., and Isahak, M. A. F. **Presenter:** **Nur Hamizah Abdul Ghani**	Process Modeling and Simulation

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Paper ID & Paper Title	Authors & Presenter	Sub-Themes
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CAFEi2023: 002-003 Design, Fabrication and Testing of a Double - Row Tractor Mounted Potato Digger - Conveyor	Shiru J. J., **Gana, I.M.**, Aliyu, E. O., Ahmed, R. O., Ekwe, N. B., and Akpo, C. O. **Presenter: Shiru, J. J.**	Agricultural Mechanization and Automation
CAFEi2023: 128-114 Early Design of Mechanised Pineapple Transplanter Using Pneumatic	Saharrudin, A. S., **Mahadi, M. R.**, Kassim, M. S. M., and Hasan, W. Z. W. **Presenter: Ahmad Safiuddin Saharrudin**	Agricultural Mechanization and Automation
CAFEi2023: 164-140 Cordless Palm Oil Cutter, P-1 for Small Holder's Plantation	Yusof, A.H. A., **Mat Akir, R.**, and Md Yusop, N. **Presenter: Ahmad Haziq Ahmad Yusof**	Agricultural Mechanization and Automation
CAFEi2023: 097-077 Testing and Evaluation of Newly Developed Harvesting Basket Among Male Pineapple Harvesters in Johor, Malaysia	Suhaimi, S. N. A., **Abidin, E. Z.**, Malek, M. H., Ismail, S. N. S., Rasdi, I., Karuppiah, K., and Ismail. N. H. **Presenter: Emilia Zainal Abidin**	Agricultural Mechanization and Automation
CAFEi2023: 052-026 Implementation of an IOT-Based Monitoring System to Evaluate Solar Dryer Performance on Mullet Fish	**Ghafar, H.**, Rusli, W. A. W., Ismail, M. A., Abdul Nasir. S. M.F.S, Yamin, A. F. M., and Yusoff, H. **Presenter: Halim Ghafar**	Agricultural Mechanization and Automation
CAFEi2023: 161-138 Fabrication of Chitosan-Based Nanocomposite Membrane: Effect of Microwave-Treated-Loaded Chitosan Nanoparticles on the Efficient Capturing of Methylene Blue Dyes from Aqueous Solution	Katibi, K.K., **Md Yunos, K. F.**, and Othman, S. H. **Presenter: Kamil Kayode Katibi**	Food Security & Safety – Practical Approaches and Applications
CAFEi2023: 075-063 Health Risk Assessment of Arsenic and Iron in Commercial White and Brown Rice in Malaysia	**Navaretnam, R.**, Ahmad Zaharin Aris, A. Z., and Ley. J. Y. **Presenter: Raneesha Navaretnam**	Food Security & Safety – Practical Approaches and Applications
CAFEi2023: 085-056 Mitigating 3-Monochloropropane-1,2-Diol and Mineral Oil Hydrocarbon (MOH) Contaminants in Palm Production Oil Using Hot Water Dilution	Hilmi, S. M. H. S., Md Rejab, S. A., Siran, Y. M., Ngteni, R., Saparin, N., and **Zulkurnain, M.** **Presenter: Syed Mohd Hadi Syed Hilmi**	Food Security & Safety – Practical Approaches and Applications
CAFEi2023: 126-112 Agrivoltaic Chicken Farming as a Sustainable Solution in Urban Community	**Ya'acob, M. E.**, and Othman, N. F. **Presenter: Mohammad Effendy Ya'acob**	Food Security & Safety – Practical Approaches and Applications
CAFEi2023: 102-085 Use of KEKE Emitter in Drip Irrigation System	**Abubakar, S. I.**, and Abdullahi, A. S. **Presenter: Sani Isa Abu Bakar**	Soil & Water Management for Agriculture

CAFEi2023: 143-123 Hydraulic Ram Pump Development for Small Irrigation System in Upland Barangays	**Ma. Grace C. Sumaria,** M. G. C., Lua, J. B., and Guarte, R. C. **Presenter: Ma. Grace C. Sumaria**	Soil & Water Management for Agriculture
CAFEi2023: 146-127 Comparative Evaluation of Suitability Assessment of the Taguibo River Irrigation System Diversion Dam	**Bocobo, A. E.**, Ariston, J. V., Ungab, C. D. D., Cacayan Jr., A. O., and Apdohan, A. G. **Presenter: Aljon E. Bocobo**	Soil & Water Management for Agriculture
CAFEi2023: 095-084 Application of GIS And SWAT Hydrological Model for Assessing Water Yield at Taguibo River Watershed Forest Reserve (TRWFR), Butuan City, Philippine**s**	**Bocobo, A. E.**, Lajera, K. J. P., Simbolas, F. H. A., Cacayan Jr., A. O., and Apdohan, A. G. **Presenter: Aljon E. Bocobo**	Soil & Water Management for Agriculture
CAFEi2023: 035-034 Design Concept of Smart Herbicide Spraying Mobile Robot for Indoor Farming	Mansor, A. N., **El Pebrian, D.**, and Zahari, M. K. **Presenter: Ahmad Nasruddin Mansor**	Agricultural Automation & Smart Farming
CAFEi2023: 100-083 Evaluation of Static and Dynamic Arrangement Light Emitting Diode (LED) on Rockmelon Growth	Nordin , N. M., **Jamaludin, D.**, and Abd Aziz, S. **Presenter: Diyana Jamaludin**	Agricultural Automation & Smart Farming
CAFEi2023: 163-139 Correlation of Coconut (*Cocos Nucifera*) Growth Performance with Environmental Parameters Under Rain Shelter Nursery on a Roof Top Garden in Tropics	**Sulaiman, A. S. S.** **Presenter: Ahmad Syafik Suraidi Sulaiman**	Agricultural Automation & Smart Farming
CAFEi2023: 107-098 The Effect of Green Spinach (*Amaranthus Viridis* L.) Concentration Towards Physicochemical Characteristics Of Shirataki Noodles Made From Porang Flour	**Hermanto, M. B.**, Yulianingsih, R., and Indah, A. A. **Presenter: Mochamad Bagus Hermanto**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 059-044 Application of Artificial Neural Networks for Classifying Earthworms (Eudrilus Eugeniae) Moisture Content During the Drying Process	**Hendrawan, Y.**, Mei Lusi Ambarwati, M. L., Lastriyanto, A., Damayanti, R., Al Riza, D. F., Hermanto, M. B., and Sutan, S. M. **Presenter: Yusuf Hendrawan**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 040-115 Bioactive Compounds Recovery from *Morinda Citrifolia* Leaves Using Citric Acid-Catalyzed Ultrasonic Extraction	Baharin, A. N., **Mohd Thani, N.**, and Mustapa Kamal, S. M. **Presenter: Nurfatimah Mohd Thani**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 096-076 Detection of Pork Adulteration in Beef and Mutton Using Visible Near-Infrared (VIS-NIR) Coupled with Chemometrics	Zahroh, A., Pahlawan, M. F. R., Rahmawati, L., and **Masithoh, R. E.** **Presenter: Rudiati Evi Masithoh**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 141-121 Development and Quality Evaluation of Asam Laksa-Flavored Mushroom Snacks Prepared by Air Frying	**Wah, C. S.,** Nee, T, J., and Singaram, N. **Presenter: Chan Sook Wah**	Emerging & Advances of Food Science, Technology and Engineering

CAFEi2023: 117-093 Extrusion-Based 3D Food Printing: Printability Assessment on the Effect of Process Parameters of White Chocolate	**Parid, D.M.**, Baharuddin, A. S., Rahman, N. A. A., Mohammed, M. A. P., and Wakisaka, M. **Presenter: Dzieda Muhamad Parid**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 133-134 Effect of Hydrogen Peroxide and Sodium Alcohol Ether Sulphate on the Compressive Strength and Total Porosity of Porous Rice Husk Ash-Based Geopolymer Foam	**Basri, M. S. M.**, Othman, S. H., Mohammed, M. A. P., Mazlan, N., and Kamarudin, S. H. **Presenter: Mohd Salahuddin Mohd Basri**	Emerging Postharvest Engineering & Technology
CAFEi2023: 138-131 Effect of Drying Temperature on the Physico-Chemical Properties of *Lawsonia Inermis* L. (Henna) Powder	Abel, S. E. R., Azhar, N. A. R. M., Salim, H. S., and **Yusof, Y. A.** **Presenter: Yus Aniza Yusof**	Emerging Postharvest Engineering & Technology
CAFEi2023: 021-108 Advancing Food-Drying Techniques: Design and Performance of a Multi-Layered Drying Rack	Ab Aziz, I. F., **Che Man, H.**, Shamsudin, R., Ismail, M. F. S., and Bathumaly, S. **Presenter: Sangitha Bathumaly**	Emerging Postharvest Engineering & Technology
CAFEi2023: 150-130 MILP Model for Optimal Conversion of Food Waste into Poultry Pellet	Yusof, N. N., **Shukery, M. F. M.**, and Che Man, H. **Presenter: Mohamad Firdza Mohamad Shukery**	Emerging Postharvest Engineering & Technology
CAFEi2023: 172-147 Estimating an Eucalyptus Hybrid (*E. Grandis* X *E. Urophylla*) Fuel Wood as a Biomass Sources for the 10 MW Dendro Power Generation Plant	**Muhamad, M. I.**, Hizam, H., Radzi, M. A. M., Othman, M. L. O., Gomes, C., and Abdu, A. **Presenter: Mohd Izhwan Muhamad**	Emerging Postharvest Engineering & Technology
CAFEi2023: 037-018 Liquid Biphasic Flotation System (LBFS) for Separation of Protein from *Azolla Pinnata*	Kobbin, K., Peter, A. P., **Mohd Nor, M. Z.**, and Show, P. L. **Presenter: Kiishhen Kobbin**	Management & Technology Utilisation for Food and Agricultural Waste
CAFEi2023: 101-101 Assessing Heavy Metal Accumulation in Agricultural Crops in a Nickel Mining Site in Agusan Del Norte	**Capilitan, J. J.**, Tabañag, I. D. F., and Evelyn B. Taboada, E. B. **Presenter: Jobelle J. Capilitan**	Management & Technology Utilisation for Food and Agricultural Waste
CAFEi2023: 084-062 Evaluating the Effect of Low and High Temperature Mode of Subcritical Water Pre-Treated Empty Fruit Bunches on Co-Digestion Performance and Kinetic Study for Biogas Production	Hamzah, A. F. A., **Hamzah, M. H.,** Che Man, H., Khairudin, N., Ismail, M. H., and Show, P. L. **Presenter: Adila Fazliyana Aili Hamzah**	Management & Technology Utilisation for Food and Agricultural Waste
CAFEi2023: 147-128 The Crust Formation and Conductive Heat Transfer Coefficient Relationship of In-House Formulated Dough in The Deep-Frying Process	Solehan, N. S., M., **Naim, M. N**., and Abu Bakar, N. F. **Presenter: Mohd Nazli Naim**	Emerging & Advances of Food Science, Technology and Engineering

CAFEi2023: 049-025 Effects of Mixing-Grinding Parameters on the Quality Attributes of Herbal (Ulam Raja And Habbatus Sauda) Drink Powders	Effendy, N. I. M. H., Basri, M. S. M., Yusof, Y. A., Baharuddin, A. S., and **Abd Rahman, N. A.** **Presenter: Nur Aliaa Binti Abd Rahman**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 065-039 Storage Stability of Electrolyzed Oxidizing Water and Its Properties after Washing Honeydew Fruits	**Ab Aziz, N.**, Jasni, M. F. A., Sulaiman, N. S., Chen, K. G., and Khalid, N. I. **Presenter: Norashikin Ab Aziz**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 026-051 Optimization of Non-Thermal Ultrasonication Process for Retaining Nutritional Quality in Milk: Effects of Fat Percentage and Processing Parameters	Mohd. Yaakub, N., Mustapa Kamal, S. M., Chin, N. L., Julmohammad, N., **Sulaiman, A.**, Therdthai, N. **Presenter: Nurul'azah Mohd Yaakub**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 091-068 The Effect of Fermentation on Cocoa Bean Properties Using a Compact Fermentation Container with a Stirring Mechanism	**Siti Mariyam,** Saputro, A. D., Aulia, N. I., Asyahidah, I. N., and Kusuma, M. T. A. H **Presenter: Siti Mariyam**	Emerging & Advances of Food Science, Technology and Engineering
CAFEi2023: 060-060 Maturity Level Prediction and Classification of Lemon Fruit (*Citrus Limon* Cv. Montaji Agrihorti) Using Combined Reflectance-Fluorescence Computer Vision and Machine Learning Models	Laila, I. R., Tulsi, A. A., Susilo, B., and **Al Riza, D. F.** **Presenter: Indah Rustiani Laila**	Machine Vision Applications
CAFEi2023: 022-012 Characterisation of Physicochemical Properties of Mango Infected by *Colletotrichum Gloeosporioides*	Eh Teet, S., **Hashim, N.**, Siti Khairunniza Bejo, S. N., Ismail, S. N., and Ali, M. M. **Presenter: Sudau Eh Teet**	Machine Vision Applications
CAFEi2023: 020-036 Computer Vision for Monitoring Glutinous Rice Quality During Storage	**Ageh, O.,** Hashim, N., Mohd Ali, M., and Jimoh, K. A. **Presenter: Ageh Opeyemi Micheal**	Machine Vision Applications
CAFEi2023: 152-129 Comprehensive Rice Mapping Using UAV Imagery and GIS Analysis for Crop Monitoring	Halip, R. M., **Che'Ya, N. N.**, Ilahi, W. F., Berahim, M. R. I. Z., Omar, M. H., and Roslee, R. **Presenter: Rowena Mat Halip**	Machine Vision Applications
CAFEi2023: 127-113 Automatic Counting of Paulownia Tree Using UAV Images and Template Matching Technique	Wan Muhamad Baqir Mahdi, W. M. B., **Khairunniza-Bejo, S.**, and Zahari, M. N. **Presenter: Siti Khairunniza-Bejo**	Machine Vision Applications
CAFEi2023: 068-043 Enhancing the Efficiency of Infrared Drying of Desiccated Coconut Through Process Optimization and Validation	Sahari, Y, **Anuar, M. S.**, Mohd Nor, M. Z., and Abdul Ghani N. H. **Presenter: Yahya Sahari**	Advanced Processing System for Agricultural Materials
CAFEi2023: 056-033 Evaluation of Gallic Acid from Piper Betle Linn Leaves Extract: A Subcritical Water Hydrolysis Study	Rahmah, N. R., Sulaiman, A., Taip, F. S., Izhar, S., and **Kamal, S. M. M.** **Presenter: Nur Lailatul Rahmah**	Advanced Processing System for Agricultural Materials

CAFEi2023: 016-028 Time-Temperature Dependent Modelling of the Thin-Layer Drying Kinetics of Glutinous Rice	**Jimoh, K. A.**, Hashim, N., Shamshudin, R., Che Man, H., and Jahari, M. **Presenter: Kabiru Ayobami Jimoh**	Advanced Processing System for Agricultural Materials
CAFEi2023: 007-007 Kinetics of Dimensional Changes of White Glutinous Rice During Soaking	Azman, P. N. M. A., **Shamsudin, R.,** Hashim, N., and Che Man, H. **Presenter: Puteri Nurain Megat Ahmad Azman**	Advanced Processing System for Agricultural Materials
CAFEi2023: 031-061 Effect of Inulin and Xanthan Gum on the Rheological Properties and 3D Printing Behavior of Tartary Buckwheat Paste	Li, Y. J., Ho, A. H., Sylvester, M., and **Lee, J. S.** **Presenter: Li Yaojia**	Advanced Processing System for Agricultural Materials
CAFEi2023: 046-082 Effect of Sonication Time on Physicochemical and Mechanical Properties of Purple Sweet Potato Starch and Peel-Based pH Indicator Films	**Sohany, M.,** Tawakkal, I. S. M. A., Shah, N. N. A. K., Othman, S. H. and Yusof, Y. A. **Presenter: Mouluda Sohany**	Packaging Engineering
CAFEi2023: 045-067 Nanoencapsulation of Thymol in Chitosan Nanoparticle on Poly (Lactic Acid)/ Poly (Butylene Succinate)/Nanofibrillated Cellulose (PLA/PBS/NFC) for Active Food Packaging Application	Zabidi, N.A., **Tawakkal, I.S.M.A.,** Ariffin S.H., and Naim M.N. **Presenter: Nurul 'Afifah Zabidi**	Packaging Engineering
CAFEi2023: 120-141 Controlled Release and Antibacterial Activity of Corn Starch-Based Films Containing Nanocellulose and Thymol	Nordin, N., **Othman, S. H.**, Basha, R. K., and Rashid, S. A. **Presenter: Norhazirah Nordin**	Packaging Engineering

CAPRA Way

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- Our clients are our focus
- A commitment to innovation and quality
- Our people are our most significant asset
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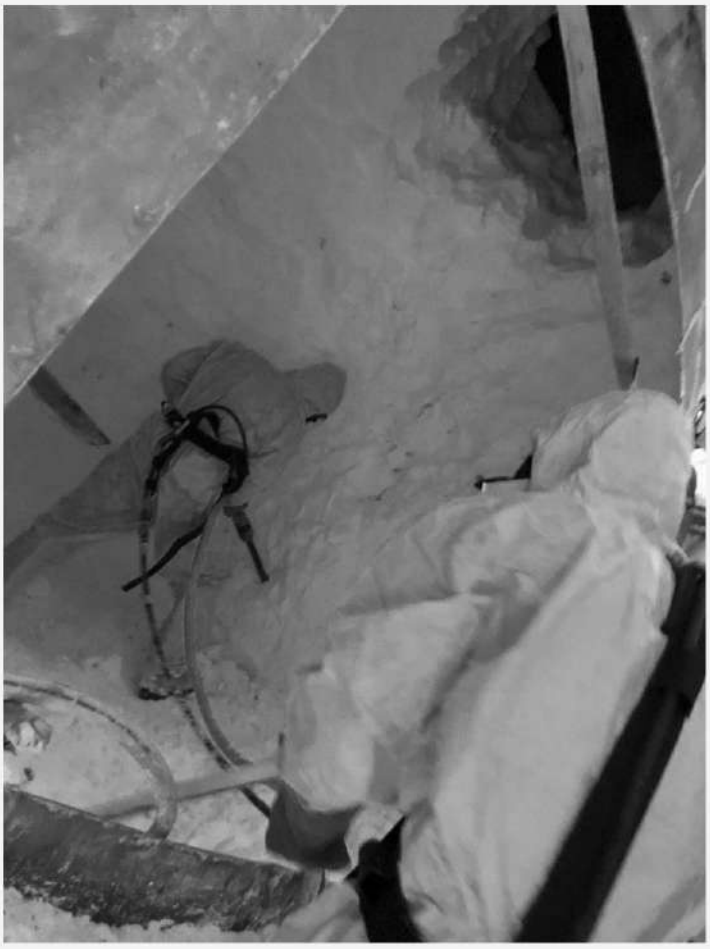

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The engineering and solution is provided by us are able to meet the DOSH standard by following CHRA provided by 3rd party.

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i. Bachelor in the field of Engineering or Engineering Technology with a CGPA of 2.750 or;
ii. Bachelor in the field of Non-Engineering or Non-Engineering Technology with a CGPA of 3.000; or
iii. Bachelor in any related field of with a CGPA of 2.500-2.999 with at least 3 years of working experience in relevant field.

Language Requirements

International candidates are required to fulfill English language requirement as follows:

a) 550 for TOEFL Paper-based Test (Academic Version); or
b) Band 6.0 for IELTS (Academic Training); or
c) 79-80 for TOEFL Internet-based Test (Academic Version).

Candidate without the requisite minimum score for TOEFL or IELTS may be granted a provisional admission. Such candidate will be required to pass an English Placement Test conducted by the University.

Fees

Fees	Master without thesis	
	Malaysian Student	International Student
Basic Fees (1st semester)	RM 1,250	RM 2,300
Basic Fees (2nd and subsequent semester)	RM 1,000	RM 2,050
Credit Fees * subject to change	RM 250 / credit	RM 400 / credit

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INTRODUCTION

This programme is designed for planning and responding to emergencies in various fields. The core courses within the programme stress on the principles and concepts in the emergency management cycle and consider technological advancement in facing emergency situations. Graduates from this programme is expected to be equipped with the tools and knowledge required for evaluating and preparing strategies at all levels of emergency response and planning.

PROGRAMME REQUIREMENTS

Credit Requirements for Graduation

Students enrolling under this programme must fulfill 40 credits of courses to graduate. The credit distributions for compulsory courses, elective courses and project are as follows:

- Compulsory Courses 25 credits
- Elective Courses 9 credits
- Dissertation 6 credits

Compulsory Courses

Students must take all the listed compulsory courses;

EAB5100	Research Methodology	3 credits
EAB5310	Natural Resources Conservation	3 credits
EAB5403	Disaster Recovery and Contingency Plan	3 credits
EAB5404	Emergency Response and Planning Network	3 credits
EAB5407	Incident and Crisis Management	3 credits
EAB5411	Emergency Risk Management	3 credits
EAB5412	Information Engineering	3 credits
EAB5977	Independent Study	1 credits
EAB5988	Dissertation	6 credits
EMM5201	Fire Safety Engineering and Regulations	3 credits

Note : EAB5988 - Dissertation is carried out over two semesters

Elective Courses

Students must take only two elective courses (3 credits) out of the listed

EAB5302	Building Services	3 credits
EAB5401	Hazard, Risk and Ethics	3 credits
EAB5405	Disaster Forecasting	3 credits
EAB5408	Medical Response for Disaster	3 credits
EAB5421	Forensic Science	3 credits
EAB5422	Public Safety and Security	3 credits
KOM5327	Crisis Communication	3 credits

Course Synopsis

EAB5100 | Research Methodology | 3 Credits
This course covers best practices in research such as research methodology, design and ethics as well as academic writing and oral presentations.

EAB5302 | Building Services | 3 Credits
This course covers topics related to various building services, ventilation systems, support systems for water supply and electricity, fire service and drainage. Emphasis is given on the relationship between environmental factors and building services, the evaluation on the effectiveness of building services and the identification of the need for repair of building services.

EAB5310 | Natural Resources Conservation | 3 Credits
The subject will cover the cause and effect of natural phenomena that is at risk of becoming a hazard and disaster to human lives, including the effect of climate change. Emphasis is given on acts related to natural resource conservation, prevention methods by technical means such as forest conservation, sustainable conservation system and post-disaster debris management.

EAB5401 | Hazard, Risk and Ethics | 3 Credits
This course covers the relationship between hazards, risks and ethics. Emphasis is given on the measurement, analyses and comparisons between various types of hazard, risks associated with hazards, and the aspect of ethics and efficiency in facing and responding to risks. This course also covers the topic of occupational hazards and risks.

EAB5403 | Disaster Recovery and Contingency Plan | 3 Credits
This course covers various types of disaster and their impacts. Emphasis is given on the measurement of the effects of disasters, and the preparation of contingency plans during critical time, prevention plans through the database application as well as recovery plans suitable for human needs.

EAB5404 | Emergency Response and Planning Network | 3 Credits
This course covers the concept of organizational network within the emergency command systems of multiple agencies. Emphasis is given on organizing emergency command systems and communication for evacuation plan.

EAB5405 | Disaster Forecasting | 3 Credits
This course discusses the application of ICT tools and GIS science (Geographical Information System and Remote Sensing) for forecasting natural and man-made disasters. This will cover the comparisons and analysis between various types of susceptibility, hazard, vulnerability and risk associated with disasters. Emphasis will be given on the concept of application and techniques such as spatial model development for a particular hazard prediction, multi criteria evaluation, statistical and datamining approaches.

EAB5407 | Incident and Crisis Management | 3 Credits
This course covers the concept of incident and crisis management. Emphasis is given on solving problems involving factors that leading to a crisis, stages of crisis, and methods of crisis control, as well as forming a team to execute a crisis management plan.

EAB5408 | Medical Response for Disaster | 3 Credits
This course covers medical operation for disasters and its components, the role of emergency medical team, as well as key issues related to medical assistance during disaster. Emphasis is given on the evaluation of emergency medical operation for natural and man-made disasters.

EAB5411 | Emergency Risk Management | 3 Credits
This course discusses various types of emergency risks, risk management policy and its implementation including integrated catastrophe models. Emphasis is given on risk reduction strategy evaluation and effective emergency risk management plan framework.

EAB5412 | Information Engineering | 3 Credits
This course covers methods of presenting information in the form of cognitive models, geospatial information engineering and virtual reality exercises. Emphasis is given on concepts related to information engineering management and information management techniques, as well as their importance in managing disasters.

EAB5421 | Forensic Science | 3 Credits
This course covers the utilization of forensic techniques for investigating disasters, industrial accidents and fire risks by analyzing physical evidence. The witness interview technique is also included. Emphasis is given on evaluating the need for forensic investigation of an incident, identifying the cause of a disaster and organizing a forensic investigation procedure.

EAB5422 | Public Safety and Security | 3 Credits
This course discusses public safety and security management system. Emphasis is given on key issues related to public and national security, the effectiveness of crisis response mechanism, disaster management, as well as the concept of total defense.

EAB5977 | Independent Study | 1 Credits
This course deals with selected innovation and engineering design fields according to current development. The studies will be based on topics that are determined by the appointed lecturer. The course emphasises knowledge seeking pertaining to the topic and producing technical report in terms of writing and oral: individually and/or in group.

EMM5201 | Fire Safety Engineering and Regulations | 3 Credits
This course covers basic principles of fire safety, and active and passive fire protection systems. Emphasis is given on Uniform Building by Law 1984 and the Fire Services Act 341, 2006 and other Code of Practice (COP), the evaluation on fire safety systems and performance based fire safety system.

KOM5327 | Crisis Communication | 3 Credits
This course covers concepts of crisis, crisis management, and crisis communication; crisis management approaches and crisis communication theory; steps in crisis prevention, preparation, recognition, containment and recovery; Planning crisis communications plan for managing organizational crisis.

EAB5988 | Dissertation | 6 Credits
This course involves a research or study by a student on a specific topic. It covers literature review, methodology, data collection and analysis under a supervision of a lecturer. A proposal report needs to be prepared at the beginning of the study. At the end of the project, the student will submit a complete dissertation and research output for evaluation. The student is also required to present the findings of the study to a panel of assessors.

Admission Requirements

i. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.750 ; or
ii. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.500-2.749 with at least 3 years of working experience in relevant field ; or
iii. Bachelor in the field of Engineering or Engineering Technology with CGPA of 2.250-2.499 with at least 5 years of working experience in relevant field ; or
iv. Bachelor in any related field of Science or Technology with CGPA of 3.000 ; or
v. Bachelor in any related field of Science or Technology with CGPA of 2.750-2.999 with at least 3 years of working experience in relevant field ; or
vi. Bachelor in any related field of Science or Technology with CGPA of 2.500-2.749 with at least 5 years of working experience in relevant field.

Note: *Candidates with Bachelor of Science or Technology degrees or their equivalents are admitted, prerequisite modules in Engineering must be offered to adequately prepare them for their advanced study.*

Language Requirements

International candidates are required to fulfill English language requirement as follows:

a) 550 for TOEFL Paper-based Test (Academic Version); or
b) Band 6.0 for IELTS (Academic Training); or
c) 79-80 for TOEFL Internet-based Test (Academic Version).

Candidate without the requisite minimum score for TOEFL or IELTS may be granted a provisional admission. Such candidate will be required to pass an English Placement Test conducted by the University.

Fees

Fees	Malaysian Student	International Student
Basic Fees (1st Semester)	RM 1,350	RM 2,400
Basic Fees (2nd and subsequent semester)	RM 1,100	RM 2,100
Credit Fees *subject to change	RM 370 / credit	RM 450 / credit

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INTRODUCTION

The Master Programme in Food Process and Packaging Engineering (MFPP) explores inter-disciplinary food science, product, innovation, entrepreneurship and packaging at an advanced level. This programme is designed to train professionals and equip them with adequate knowledge in topics related to standards and regulations in the implementation and operation of food and packaging engineering which is an important element in the food process in Malaysia. Students of MFPP Programme will study various topics including aspects of good manufacturing practices (GMP/HACCP), improving food hygiene, food safety, management of food manufacturing operations, packaging as well as those with commercial value to increase share in more sophisticated markets. The students will also learn about process and plant design elements, simulation and factory maintenance. The scope of the field of packaging engineering emphasizes important aspects according to the needs of food and packaging industry experts which includes but are not limited to modified atmosphere packaging and controlled atmospheric storage, active and intelligent packaging techniques. The MFPP programme at Universiti Putra Malaysia is the first programme of its kind to be established in Malaysia.

Programme Requirements

Credit Requirements for Graduation
Students enrolling under this programme must fulfill 40 credits of courses to graduate. The credit distributions for compulsory courses, elective courses and project are as follows:

- Compulsory Courses 24 credits
- Elective Courses 6 credits
- Dissertation 10 credits

Compulsory Courses
Students must take all the listed compulsory courses;

EPF5100	Research Methodology	3 credits
EPF5101	Food Manufacturing Operation Management	3 credits
EPF5707	Applied Food Engineering Analysis	3 credits
EPF5710	Utilization of Waste from Food Industry	3 credits
EPF5711	Packaging Machinery and Automation	3 credits
EPF5703	Package Permeability and Shelf Life of Food	3 credits
EPF5712	Packaging Evaluation and Testing	3 credits
EPF5713	Food Plant Sanitation Design and Maintenance	3 credits
EPF5990	Dissertation	10 credits

Note : EPF5990 - Dissertation is carried out over two semesters (4+6 credits)

Elective Courses
Students must take only two elective courses (6 credits) out of the listed;

EPF5102	Manufacturing of Packaging Materials	3 credits
EPF5103	Food Packaging Innovations	3 credits
EPF5208	Drying Technology for Food and Bioproducts	3 credits
EPF5601	Applied Statistics and Probability for Engineers	3 credits
EPF5702	Food Rheology	3 credits
EPF5714	Advanced Food Process Engineering	3 credits

Course Synopsis

EPF5100 | Research Methodology | 3 Credits
This course covers the knowledge and skills required to prepare a research proposal. It also discusses the fundamental process in conducting an academic research, the theoretical and practical aspects of preparing a research proposal presented.

EPF5101 | Food Manufacturing Operation Management | 3 Credits
This course covers the management of food manufacturing operations, strategies and tools to analyse and improve operational performance. Emphasis is given on problem solving techniques including the usage of computer simulation and strategic decision-making to ensure efficient food manufacturing operation.

EPF5707 | Applied Food Engineering Analysis | 3 Credits
This course covers the treatment and interpretation of food engineering unit operations into mathematical models for analysis. It also emphasises on the use of computer simulation in the analysis of food engineering design.

EPF5710 | Utilization of Waste from Food Industry| 3 Credits
This course covers several types of waste from the food processing industry as well as methods to reduce the food waste. It also includes designing a process to convert food processing waste into useful materials.

EPF5711 | Packaging Machinery and Automation | 3 Credits
This course covers the application of machineries and control technology for automated packaging system. It includes major automation elements such as human-machine interfaces (HMIs), actuators, sensors, programmable logic controllers (PLCs) and machinery maintenance. Quality control system of various automated food packaging systems is also explained.

EPF5703 | Package Permeability and Shelf Life of Food | 3 Credits
This course covers the theory and concept of package permeability and the effects on the extension and deterioration of food shelf life. It also emphasis the relationship between barrier properties of packaging materials and permeability properties.

EPF5712 | Packaging Evaluation and Testing | 3 Credits
This course covers the scientific and engineering knowledge used in testing and evaluating performance, and interaction of package-product systems during handling and transportation. This knowledge is also applied for quality control testing of the packaging to meet standards and other requirements, and for improving the packaging quality and integrity.

EPF5713 | Food Plant Sanitation Design and Maintenance | 3 Credits
This course covers the principles to design food plants and to update an existing facility or equipment for optimum food safety and sanitation control. It also integrates food safety techniques with reliability and maintenance engineering techniques.

EPF5990 | Dissertation | 10 Credits
This course involve a research or study by a student on a specific topic. Every student is required to carry out a supervised project. Students are required to prepare a dissertation report and present the findings of the study to a panel assessors. The topic is chosen from one of the following areas: Food engineering, waste utilisation from industry, food package design system including packaging materials, packaging design, production system or any engineering fields deemed appropriate by the program.

EPF5102 | Manufacturing of Packaging Materials | 3 Credits
This course covers the management of food manufacturing operations, strategies and tools to analyse and improve operational performance. Emphasis is given on problem solving techniques including the usage of computer simulation and strategic decision-making to ensure efficient food manufacturing operation.

EPF5103 | Food Packaging Innovations | 3 Credits
This course covers advanced packaging materials, design and implementation of smart packaging techniques and packaging development for a sustainable package. It also includes considerations and requirements and current issues in developing innovative food packaging.

EPF5208 | Drying Technology for Food and Bioproducts | 3 Credits
This course covers the importance, concepts and types of drying operation. The drying applications in foods and bioproducts are also explained in detail in this course.

EPF5601 | Applied Statistics and Probability for Engineers | 3 Credits
This course covers the concept of applied statistics and probability for engineers. It develops understanding on random sampling, design of experiments and data description for statistical quality control.

EPF5702 | Food Rheology | 3 Credits
This course covers the roles, importance and measurement methods of rheological properties of food. Its applications in food processing are also explained in this course.

EPF5714 | Advanced Food Process Engineering | 3 Credits
This course introduces advanced theory essential to an understanding of food process modelling and advanced food engineering technologies. These technologies will include innovative thermal, non-thermal and emerging food applications in food processing industries, in which, critical parameters that entail these technologies and its usage in producing safe food will be discussed.


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9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
SUSTAINABLE DEVELOPMENT GOALS